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VOL. 6. SNAPPERS OF THE WORLD

AN ANNOTATED AND ILLUSTRATED CATALOGUE OF LUTJANID SPECIES KNOWN TO DATE

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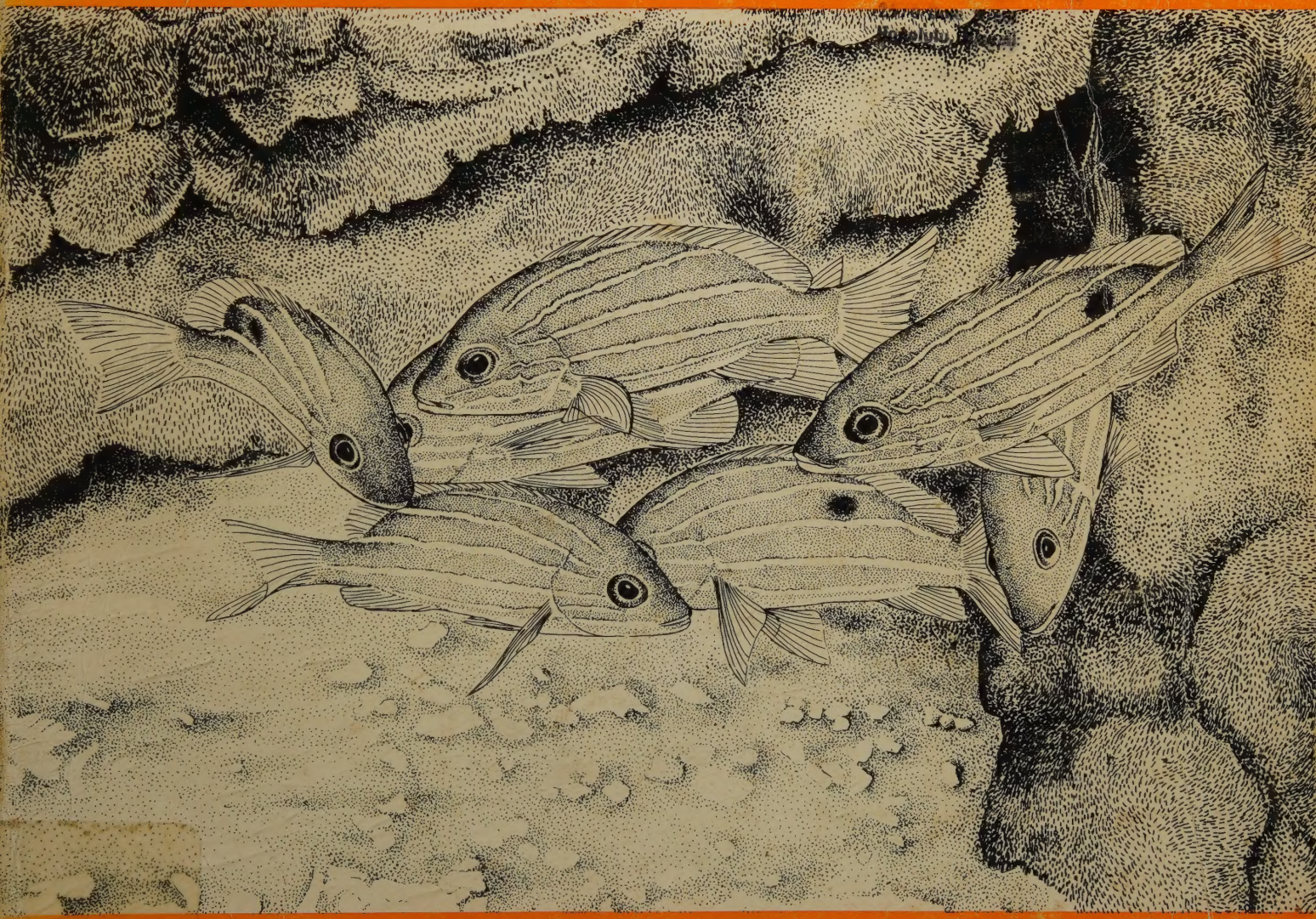

UNITED NATIONS DEVELOPMENT PROGRAMME
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

FAO Fisheries Synopsis No. 125, Volume 6

FIR/S125 Vol. 6

FAO SPECIES CATALOGUE

VOL. 6 SNAPPERS OF THE WORLD

An Annotated and Illustrated Catalogue of Lutjanid Species Known to Date

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, December 1985

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PREPARATION OF THIS DOCUMENT

The present publication was initiated under the UNDP/FAO Project for the Survey and Identification of World-Marine Fish Resources (GLO/82/001) and finalized and printed under the FAO Regular Programme.

The catalogue represents an extension of work carried out by the author in collaboration with Dr F.H. Talbot on the taxonomy of Indo-West Pacific species of Lutjanus. It also draws on work now in progress by Dr W.D. Anderson, Jr., involving species of the subfamilies Apsilinae and Etelinae and on the FAO Species Identification Sheets for the western central Atlantic (Fishing Area 31), the eastern central Atlantic (Fishing Areas 34/47 in part) and the western Indian Ocean (Fishing Area 51), most of which were prepared by the present author.

During the preparatory phase of this project, the author conducted extensive field work throughout much of the range of Lutjanidae, particularly in the Indo-Pacific region. Furthermore, the author's participation in the NMFS Workshop on the Biology of Tropical Groupers and Snappers (Honolulu, Hawaii 20 to 22 May, 1985) provided valuable fisheries and general biological information which could not have been obtained otherwise.

In the final stages of the work, the author visited Rome and assisted FAO staff with the processing of the manuscript for printing. The indexes of scientific and vernacular names were prepared in collaboration with FAO's Fishery Information, Data and Statistics Service.

Because of the great importance of colour pattern as a diagnostic tool for species identification, it was decided to include colour paintings of each family member.

Illustrations : R. Swainston (Perth, Australia) - colour paintings of 75 species and many black and white sketches; M. Thompson (Perth, Australia) - colour paintings of 27 species; O. Lidonnici (FAO, Rome) - colour paintings of 1 species and several black and white sketches; P. Lastrico (FAO, Rome) - colour paintings of 4 species, several black and white sketches and all distribution maps.

Technical Editor : W. Fischer, Fishery Resources and Environment Division, FAO.

ABSTRACT

This is the sixth in the FAO series of worldwide annotated and illustrated catalogues of major groups of organisms that enter marine fisheries. The present volume includes 103 lutjanid species belonging to 17 genera. It provides comprehensive, illustrated keys and a glossary of technical terms and measurements. Individual accounts of species include drawings, scientific and vernacular names, information on habitat, biology and fisheries, and a distribution map. The work is fully indexed and there is ample reference to pertinent literature.

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TABLE OF CONTENTS

		Code	Colour Plates	Page
1.	INTRODUCTION			1
	1.1 Plan of the Catalogue			2
	1.2 General Remarks on Lutjanids			3
	1.3 Illustrated Glossary of Technical Terms and Measurements			8
2.	SYSTEMATIC CATALOGUE			13
	2.1 Illustrated Key to Genera and Monotypic Species			13
	2.2 Information by Species			18
	Aphareus	LUT Aph		18
	Aphareus furcatus	LUT Aph 1	X, 36	18
	Aphareus rutilans	LUT Aph 2	X, 37	19
	Aprion	LUT Apri		20
	Aprion virescens	LUT Apri 1	X, 38	20
	Apsilus	LUT Apsi		21
	Apsilus dentatus	LUT Apsi 1	I, 1, 1a	22
	Apsilus fuscus	LUT Apsi 2	VI, 20	23
	Etelis	LUT Etel		24
	Etelis carbunculus	LUT Etel 3	X, 39	26
	Etelis coruscans	LUT Etel 2	X, 40	27
	Etelis oculatus	LUT Etel 1	I, 2	28
	Etelis radiosus	LUT Etel 1	XI, 41	29
	Hoplopagrus	LUT Hoplo		30
	Hoplopagrus guntheri	LUT Hoplo 1	VII, 26	30
	Lipocheilus	LUT Lipo		32
	Lipocheilus carnolabrum	LUT Lipo 1	XI, 42	32
	Lutjanus	LUT Lut		33
	Lutjanus adetii	LUT Lut 43	XI, 43	52
	Lutjanus agennes	LUT Lut 24	VI, 21	53
	Lutjanus ambiguus	LUT Lut 44	I, 3	54
	Lutjanus analis	LUT Lut 13	I, 4	55
	Lutjanus apodus	LUT Lut 14	II, 5	56
	Lutjanus aratus	LUT Lut 45	VII, 27, 27a	57
	Lutjanus argentimaculatus	LUT Lut 1	XI, 44, 44a, 44b	58
	Lutjanus argentiventris	LUT Lut 46	VIII, 28	60
	Lutjanus bengalensis	LUT Lut 29	XII, 45	61
	Lutjanus biguttatus	LUT Lut 30	XII, 46	62
	Lutjanus bitaeniatus	LUT Lut 47	XII, 47, 47a	63
	Lutjanus bohar	LUT Lut 20	XII, 48	64
	Lutjanus boutton	LUT Lut 48	XIII, 49	66
	Lutjanus buccanella	LUT Lut 15	II, 6	67
	Lutjanus campechanus	LUT Lut 16	II, 7	68
	Lutjanus carponotatus	LUT Lut 49	XIII, 50	69

	Code	Colour Plates	Page
Lutjanus coeruleolineatus	LUT Lut 32	XIII, 51	70
Lutjanus colorado	LUT Lut 50	VIII, 29	71
Lutjanus cyanopterus	LUT Lut 17	II, 8	72
Lutjanus decussatus	LUT Lut 51	XIII, 52	73
Lutjanus dentatus	LUT Lut 25	VI, 22	74
Lutjanus dodecanthoides	LUT Lut 52	XIV, 53	75
Lutjanus ehrenbergii	LUT Lut 34	XIV, 54	76
Lutjanus endecacanthus	LUT Lut 26	VI, 23	77
Lutjanus erythropterus	LUT Lut 8	XIV, 55, 55a	78
Lutjanus fulgens	LUT Lut 27	VI, 24	79
Lutjanus fulviflamma	LUT Lut 3	XIV, 56	80
Lutjanus fulvus	LUT Lut 35	XV, 57	82
Lutjanus fuscescens	LUT Lut 53	XV, 58, 58a	83
Lutjanus gibbus	LUT Lut 4	XV, 59, 59a	84
Lutjanus goldiei	LUT Lut 54	XVI, 60, 60a, 60b	86
Lutjanus goreensis	LUT Lut 28	VII, 25	87
Lutjanus griseus	LUT Lut 18	III, 9, 9a	88
Lutjanus guilcheri	LUT Lut 42	XVI, 61	89
Lutjanus guttatus	LUT Lut 55	VIII, 30	90
Lutjanus inermis	LUT Lut 56	VIII, 31	91
Lutjanus jocu	LUT Lut 19	III, 10	92
Lutjanus johnii	LUT Lut 6	XVII, 62	94
Lutjanus jordani	LUT Lut 57	IX, 32	95
Lutjanus kasmira	LUT Lut 36	XVII, 63	96
Lutjanus lemniscatus	LUT Lut 5	XVII, 64, 64a	97
Lutjanus lunulatus	LUT Lut 37	XVII, 65	98
Lutjanus lutjanus	LUT Lut 7	XVIII, 66	99
Lutjanus madras	LUT Lut 38	XVIII, 67	100
Lutjanus mahogoni	LUT Lut 20	III, 11	101
Lutjanus malabaricus	LUT Lut 10	XVIII, 68, 68a	102
Lutjanus maxweberi	LUT Lut 58	XVIII, 69	103
Lutjanus mizenkoi	LUT Lut 59	XIX, 70	105
Lutjanus monostigma	LUT Lut 39	XIX, 71	106
Lutjanus notatus	LUT Lut 33	XIX, 72	107
Lutjanus novemfasciatus	LUT Lut 60	IX, 33	108
Lutjanus peru	LUT Lut 61	IX, 34	109
Lutjanus purpureus	LUT Lut 21	IV, 12	110
Lutjanus quinquelineatus	LUT Lut 40	XIX, 73	111
Lutjanus rivulatus	LUT Lut 41	XX, 74, 74a	112
Lutjanus russelli	LUT Lut 9	XX, 75, 75a, 75b, 75c	113
Lutjanus sanguineus	LUT Lut 31	XXI, 76	115
Lutjanus sebae	LUT Lut 11	XXI, 77, 77a, 77b	116
Lutjanus semicinctus	LUT Lut 62	XXI, 78	117
Lutjanus stellatus	LUT Lut 63	XXII, 79	118
Lutjanus synagris	LUT Lut 22	IV, 13, 13a	119
Lutjanus timorensis	LUT Lut 64	XXII, 80, 80a	121
Lutjanus viridis	LUT Lut 65	IX, 35	122
Lutjanus vitta	LUT Lut 22	XXII, 81, 81a	123
Lutjanus vivanus	LUT Lut 23	IV, 14	124
Macolor	LUT Mac		125
Macolor macularis	LUT Mac 2	XXIII, 82, 82a	126
Macolor niger	LUT Mac 1	XXIII, 83, 83a	127
Ocyurus	LUT Ocyur		129
Ocyurus chrysurus	LUT Ocyur 1	V, 15	129
Paracaesio	LUT Para		130
Paracaesio caeruleus	LUT Para 2	XXIII, 84	132
Paracaesio gonzalesi	LUT Para 3	XXIII, 85	133
Paracaesio kusakarii	LUT Para 4	XXIV, 86	134
Paracaesio sordidus	LUT Para 5	XXIV, 87	135
Paracaesio stonei	LUT Para 6	XXIV, 88	136
Paracaesio xanthurus	LUT Para 1	XXIV, 89	137

	Code	Colour Plates	Page
Parapristipomoides	LUT Paraprist		138
Parapristipomoides squamimaxillaris	LUT Paraprist 1	XXV, 90	138
Pinjalo	LUT Pinj	XXV, 91	139
Pinjalo pinjalo	LUT Pinj 1	XXV, 91	139
Pinjalo sp.	LUT Pinj 2	XXV, 92	140
Pristipomoides	LUT Prist		141
Pristipomoides aquilonaris	LUT Prist 2	V, 16	144
Pristipomoides argyrogrammicus	LUT Prist 8	XXV, 93	145
Pristipomoides auricilla	LUT Prist 9	XXVI, 94	146
Pristipomoides filamentosus	LUT Prist 5	XXVI, 95	147
Pristipomoides flavipinnis	LUT Prist 10	XXVI, 96	149
Pristipomoides freemani	LUT Prist 4	V, 17	150
Pristipomoides macrophthalmus	LUT Prist 3	V, 18	151
Pristipomoides multidens	LUT Prist 6	XXVI, 97	152
Pristipomoides sieboldii	LUT Prist 7	XXVII, 98	153
Pristipomoides typus	LUT Prist 1	XXVII, 99	154
Pristipomoides zonatus	LUT Prist 11	XXVII, 100	155
Randallichthys	LUT Rand		156
Randallichthys filamentosus	LUT Rand 1	XXVII, 101	156
Rhomboplites	LUT Rhomb 1		157
Rhomboplites aurorubens	LUT Rhomb 1	V, 19	157
Symphorichthys	LUT Sympho		158
Symphorichthys spilurus	LUT Sympho 1	XXVIII, 102, 102a	158
Symphorus	LUT Symphor		160
Symphorus nematophorus	LUT Symphor 1	XXVIII, 103, 103a	160

3. PROVISIONAL LIST OF NOMINAL SPECIES OF INDO-WEST PACIFIC LUTJANIDAE 162

4. LIST OF SPECIES BY MAJOR FISHING AREAS 167

5. BIBLIOGRAPHY 176

6. INDEX OF SCIENTIFIC AND VERNACULAR NAMES 191

7. COLOUR PLATES 207

1. INTRODUCTION

This catalogue covers all of the 103 lutjanid species presently known regardless of their current commercial importance. Aside from a taxonomic review (in press) of the 39 species of Lutjanus from the Indo-West Pacific by the present author in collaboration with F.H. Talbot, it is based primarily on information from literature, supplemented with examination of museum specimens. The catalogue is not intended as a definitive work on the classification, biology, and fisheries of lutjanid fishes, but rather as a state-of-the-art guide which will serve as a foundation for further work. Despite the commercial importance of many species, fisheries information is scarce for most areas. Separate catch statistics are lacking for most species and many areas report only "lumped" snapper landings. There are perhaps three major reasons for this paucity of information: (1) many of the species are similar in appearance and are therefore frequently confused; (2) also several species which are valid have previously been treated as synonyms; and (3) the nature of snapper fisheries is largely artisanal, and hence undocumented.

There are relatively few fisheries-oriented publications dealing exclusively with lutjanid fishes. Much of the literature consists of systematic papers or books with only brief comments related to fisheries. Therefore the information contained in the Interest to Fisheries sections in this catalogue is often rather sketchy. Most of the references given, particularly those for the Indo-West Pacific species, are recent works selected because of their comprehensive nature and inclusion of diagnostic colour illustrations. Two geographic regions, the eastern Pacific and eastern Atlantic Oceans, are poorly documented in recent literature, and up-to-date revisions are required. In order to avoid unnecessary cluttering of the text with numerous literature citations, every effort was made to restrict these to papers considered of specific relevance to the species in question. Many others, particularly those on systematics, anatomy, distribution, and the more general aspects of biology and fisheries, are included only in the bibliography. A number of older systematic works are still widely used for identification and diagnostic information. These include: Jordan & Swain (1885), and Jordan & Evermann (1896) for reviews of eastern Pacific and western Atlantic species; and Fowler (1931), and Weber & De Beaufort (1936) for treatment of the Indo-West Pacific species. Also, the impact of the French naturalists Cuvier & Valenciennes has been considerable. These authors described, mainly in their Histoire naturelle des Poissons (1828-1833), no less than 76 nominal lutjanid species. Another valuable contribution was made by the Dutch ichthyologist Pieter Bleeker, who described 30 nominal species. The 106 species described by these 19th century authors represent 35% of the 303 nominal species currently allocated to this family (see Section 3).

Colour illustrations were prepared by R. Swainston, M. Thompson, P. Lastrico and O. Lidonnici under the direct supervision of the author. Where possible, they are based on colour photographs of either live fishes taken underwater or of freshly dead specimens. Colour illustrations in the literature were also used for this purpose and in a few cases where no photographs existed, published colour notes were utilized. Black and white drawings were prepared mainly from systematic literature or museum specimens, by Swainston, but some were also adapted and redrawn by Thompson, Lidonnici and P. Lastrico. All distribution maps were drawn by Lastrico.

Acknowledgements

The author wishes to express his thanks to all those who have contributed to the preparation of this catalogue. Particularly helpful were J.E. Randall, Bernice P. Bishop Museum (Honolulu) who made available specimens and photographs of lutjanid species from a wide area of the Indo-West Pacific and W.D. Anderson Jr., Grice Marine Biological Laboratory (Charleston, USA) for contributing valuable information on genera other than Lutjanus. A.D. Lewis (Ministry of Agriculture and Fisheries, Fiji), U. Raj (University of the South Pacific, Fiji) and A. Kerstitch (Tuscon, Arizona) provided valuable photographs of rare or poorly known species.

Special thanks are due to FAO and UNDP for their financial support, which provided opportunities for field visits to Indonesia and the Arabian peninsula, study visits to several European museums where important type specimens were examined, and visits to FAO HQ in Rome, in connection with the gathering of fisheries information and the preparation of this document for printing. The author also acknowledges the assistance of FAO personnel, in particular, the editor of the series, W. Fischer, the illustrators Messrs P. Lastrico and O. Lidonnici, Giulia Sciarappa-Demuro who word-processed the text and Gloria Soave who reviewed the bibliography.

Dr F.H. Talbot, Director of the California Academy of Sciences (San Francisco) generously provided financial assistance for a lutjanid study visit to CAS by the author and for his contributions to the study of Indo-West Pacific Lutjanus.

S. Ralston, National Marine Fisheries Service (Honolulu) was instrumental in procuring funds for the author's participation in a snapper workshop at Honolulu in May, 1985, where much valuable fisheries information appearing in this catalogue was obtained. The author is indebted to all the participants at this meeting. The papers which were presented will be ultimately published in a single volume (see Ralston & Polovina, and also individual papers in bibliography).

The author wishes to thank the Director, J. Bannister, and Board of Trustees of the Western Australian Museum for their continuing support of his research on lutjanid fishes. The study of this group was greatly facilitated by the loan of specimens and access to collections provided by curatorial staff including M.-L. Bauchot (Muséum d'Histoire Naturelle, Paris, France); M. Boeseman and M. van Oijen (Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands); W.N. Eschmeyer and T. Iwamoto (California Academy of Sciences, San Francisco, USA), P. Kaesbauer, formerly Naturhistorisches Museum, Vienna, Austria), W. Klausewitz, Natur-Museum Senckenberg, Frankfurt a/M, Federal Republic of Germany); R.J. McKay (Queensland Museum, Brisbane, Australia); H. Njissen, Instituut voor Taxonomische Zoölogie, Zoögisch Museum Amsterdam, the Netherlands); J.R. Paxton and D.F. Hoese (Australian Museum, Sydney, Australia); J.E. Randall (B.P. Bishop Museum, Honolulu, Hawaii, USA); D.E. Rosen and C.L. Smith (American Museum of Natural History, New York, USA); W.F. Smith-Vaniz (Academy of Natural Sciences, Philadelphia, USA); V.G. Springer (US National Museum of Natural History, Washington D.C., USA); P.J.P. Whitehead (British Museum of Natural History, London, UK).

Personal thanks are also due to the illustrators R. Swainston and M. Thompson of Perth (Australia), who prepared most of the colour paintings and to Connie Allen, the author's wife, who typed much of the first draft, and assisted with the compilation of the bibliographic list of nominal species, and the list of local lutjanid names.

1.1 Plan of the Catalogue

This catalogue is arranged alphabetically by genera and species. Each of the multispecies genera is introduced with general descriptive remarks, illustrations of diagnostic features, highlights on the biology, and relevance to fisheries. The information pertaining to each species is arranged by paragraphs, as follows: (1) scientific name, (2) synonymy, (3) FAO species names, (4) diagnostic features, (5) geographical distribution, (6) habitat and biology, (7) size, (8) interest to fisheries, (9) local species names, (10) literature, and (11) remarks.

(1) **Scientific name :** Reference is given to the original description of each species so no confusion will arise as to precise identification.

(2) **Synonymy:** Synonyms are listed (frequent misidentifications are discussed under (11) remarks).

(3) **FAO species names :** English, French and Spanish names for each species, to be used primarily within FAO, were selected on the basis of the following criteria: (i) each name must apply to one species only, in a worldwide context; (ii) the name should not lead to confusion with other groups. Wherever possible, the names selected were based on vernacular names (or parts of names) already in existence within the areas where the species is fished. FAO species names are, of course, not intended to replace local species names, but they are considered necessary to overcome the considerable confusion caused by the use of a single name for many different species, or several names for the same species.

(4) **Diagnostic features :** Distinctive characters of the species are given as an aid for identification, accompanied by pertinent illustrations. Species identifications should be attempted only after consultation of the illustrated key to genera and species.

(5) **Geographical distribution :** The entire known geographic range of the species is given in the text and shown on a small map. Shading encompasses actual locality records as well as areas of expected occurrence.

(6) **Habitat and biology :** General information concerning bottom type, depth range, food habits, behaviour and other biological aspects is given.

(7) **Size :** The maximum known, as well as the common total length are given. Total length is measured from the tip of the snout to the tip of the longest caudal rays. The size at first maturity is also given for some species.

(8) **Interest to fisheries :** This paragraph gives an account of the nature of the fishery and, where possible, its importance is qualitatively estimated. Data on utilization (fresh, dried, frozen, canned, etc.) are given where available. Here too, the quality and quantity of the information available vary considerably with the species.

(9) **Local species names:** These are the names used locally for the various species. The present compilation is necessarily incomplete, since only a fraction of the local names used throughout the world is actually published. In many cases, local names are available only for species supporting documented fisheries. Apart from possible omissions due to limitations of literature available, some of the names included may be somewhat artificial (i.e. through transliteration of indigenous words into English). The local species name is preceded by the name of the country or geographic locality concerned (in capital letters).

(10) **Literature :** This includes references to important, usually well illustrated, publications relevant to the species, the emphasis being on identification. Additional references on biology and fisheries are included in the bibliography.

(11) **Remarks :** Important information concerning the species and not fitting in any of the previous paragraphs is given here. For instance, in some cases the scientific name used in the present catalogue, although nomenclaturally correct, is not the best known.

1.2 General Remarks on Lutjanids

The Lutjanidae is a family composed of 17 genera and 103 species of mostly reef-dwelling marine fishes collectively known as snappers. Some of their major morphological features have been discussed and illustrated by Johnson (1980). The family Lutjanidae is divisible into four subfamilies: (1) the Etelinae containing five genera: Aphareus, Aprion, Etelis, Pristipomoides and Randallichthys; these are relatively elongate fishes with a lunate to deeply forked caudal fin, scaleless dorsal and anal fins, and generally with the last dorsal and anal fin rays produced (longer than penultimate rays); (2) the Apsilinae containing four genera: Apsilus, Lipocheilus, Paracaesio and Parapristipomoides; these are moderately elongate to moderately deep-bodied fishes with a lunate to deeply forked caudal fin, scaleless dorsal and anal fins, and generally with the last dorsal and anal fin rays not produced (shorter than penultimate ray); (3) the Paradicichthyinae containing two monotypic genera: Symphorus and Symphorichthys; these are relatively deep-bodied fishes with an emarginate or slightly forked caudal fin, scaly sheaths at the bases of the dorsal and anal fins, no teeth on the vomer, and some of the anterior dorsal and anal soft fin rays produced into filaments; (4) the Lutjaninae containing five monotypic genera: Hoplopagrus, Macolor, Ocyurus, Pinjalo and Rhomboplites, and the 65 known species of the genus Lutjanus; these are slender to deep-bodied fishes with a truncate to deeply forked caudal fin, scaly sheaths at the bases of the dorsal and anal fins, teeth present on the vomer, and without filamentous soft dorsal or anal fin rays.

On the basis of various internal characters including jaw musculature, skull morphology, and certain osteological features related to the axial and caudal skeletons, Johnson (1980) postulated that the Etelinae is the most primitive group, with the Apsilinae intermediate to Lutjaninae and Paradicichthyinae, which are considered to be the most advanced groups (Fig. 1). Johnson further hypothesized that the Paradicichthyinae are the primitive sister group of the Lutjaninae and of the closely related family Caesionidae. The caesionids, commonly known as fusiliers, have been historically treated as lutjanids, but they exhibit a unique specialization of the premaxillary bone in which the ascending process is a completely separate ossification. That family contains four genera, Caesio, Pterocaesio, Gymnocaesio and Dipterygonotus, which are highly adapted for plankton-feeding. The Caesionidae and Lutjanidae constitute the superfamily Lutjanoidea. Although both the Lutjanoidea and family Lutjanidae share a number of generalized percoid characters (see Johnson, 1980), no unique specialization has been found that characterizes either group.

The family Lutjanidae is mainly confined to tropical and subtropical marine waters, although three species of Indo-Pacific Lutjanus inhabit fresh water, and the juveniles of several species in this genus frequent brackish mangrove estuaries and the lower reaches of freshwater streams. The family is divisible into four discrete geographical faunas: (1) eastern Pacific, (2) Indo-West Pacific, (3) eastern Atlantic and (4) western Atlantic. No species is found in more than a single region. However, there is a record of Lutjanus argentimaculatus from the Mediterranean coast of Lebanon, presumably having dispersed from the northern Red Sea via the Suez Canal. Many of the species, particularly members of Aphareus, Aprion, Etelis, Lutjanus, Macolor, Paracaesio, Pinjalo and Pristipomoides have broad distributions encompassing wide areas of the Indo-West Pacific region. Some of these species such as Lutjanus bohar, L. gibbus, L. kasmira, L. monostigma and L. rivulatus, as well as species of Etelis, Paracaesio and Pristipomoides are frequently associated with oceanic insular localities. Relatively few species have greatly restricted distributions and some of these may be more widespread, but because of their relatively deep habitat, they are seldom collected. Examples of localized species include Lutjanus adetii (New Caledonia and eastern Australia), L. ambiguus (southern Florida and Cuba), L. bitaeniatus (eastern Indonesia-northwestern Australia), L. coeruleolineatus (seas surrounding the Arabian Peninsula), L. dodecacanthoides (eastern Indonesia and the Philippines), L. goldiei (southern New Guinea), L. maxweberi (eastern Indonesia, the Philippines and New Guinea), L. notatus (Mauritius, Reunion, Madagascar, Natal and Mozambique), L. stellatus (southern Japan to Hong Kong), Paracaesio caeruleus (southern Japan), Parapristipomoides squamimaxillaris (Easter Island and Rapa), Pristipomoides freemani (Atlantic coast of Panama to Suriname), and P. macrophthalmus (Greater Antilles and Caribbean coast of Nicaragua and Panama). In addition, the five species of Lutjanus inhabiting the west African coast have relatively restricted distributions. The general distribution pattern of the four subfamilies of Lutjanidae are indicated in Fig. 2.

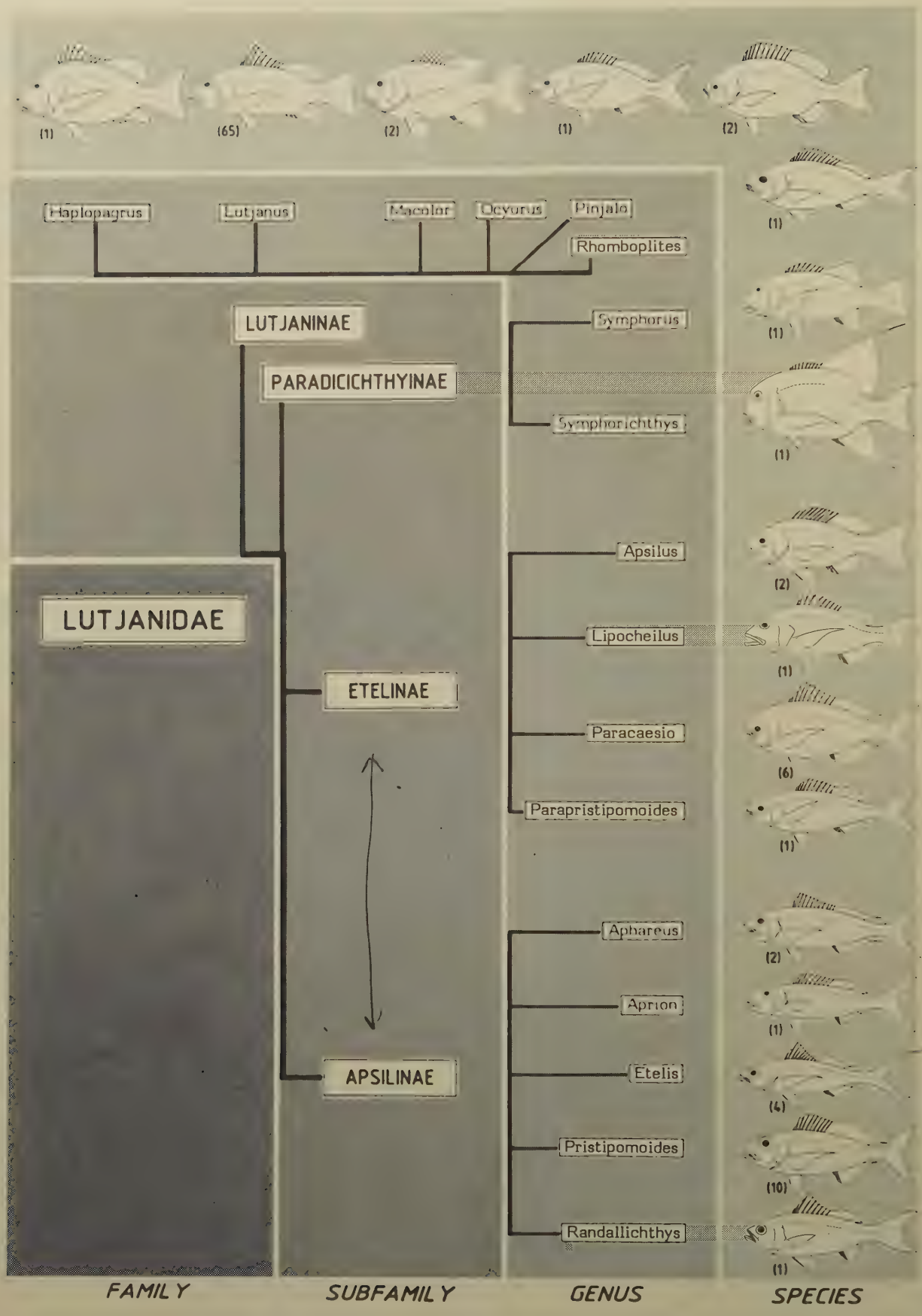


Fig. 1 Every genus is illustrated by one typical representative.
The number of species in each genus is given in parenthesis

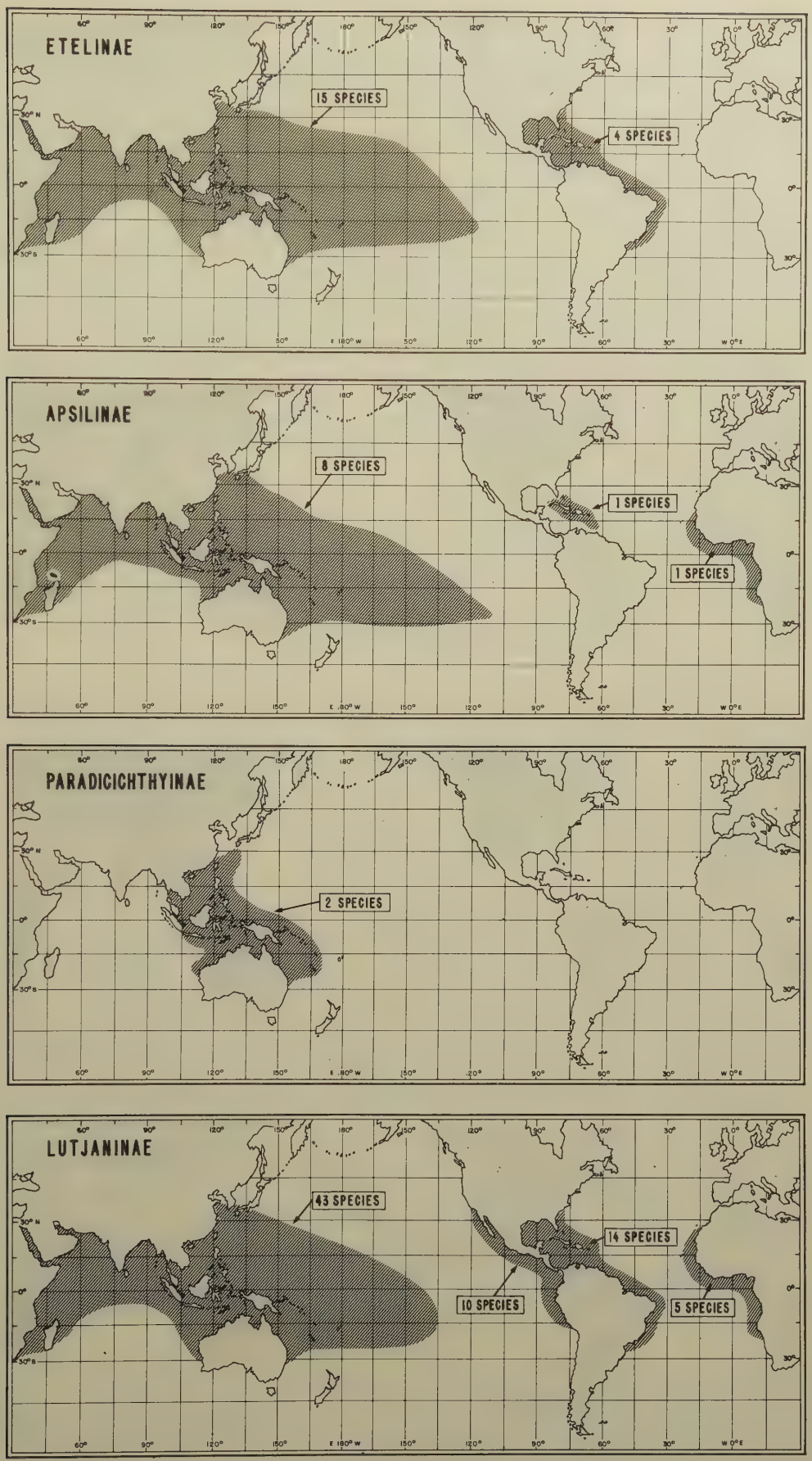


Fig. 2 General distribution pattern by subfamilies in the family Lutjanidae.

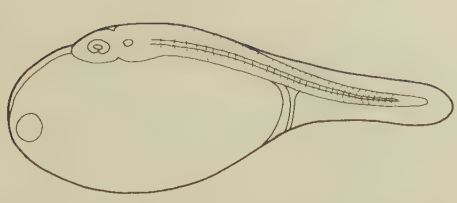
Lutjanids are dioecious (separate sexes) and display little or no sexual dimorphism in structure or colour pattern. The reproductive pattern is that of gonochorism: following sexual differentiation, the sex remains constant throughout the life cycle. On the average, lutjanids reach first maturity at about 43 to 51% of the maximum total length, with males maturing at a slightly smaller size than females. Based on larval abundance, two types of seasonal reproductive patterns are common among the family: (1) a protracted summer season, and (2) a more or less continuous pattern with peak activity in the spring and fall. Lutjanids are batch-spawners with individual females generally spawning several times each season. There have been few sightings of the actual spawning act, but the general pattern is probably similar to that reported for captive Lutjanus kasmira in Japan by Suzuki & Kioki (1979). Group spawning of 10 or more fish occurred in the evening or at night during August with water temperatures ranging from 22.2 to 25.2^{o}C. Males initiated courtship by pecking and rubbing against the body of a female. Eventually other fish joined the activities and initiated a spiral ascent, releasing gametes just below the surface. The pelagic eggs of lutjanids are generally spherical with diameters ranging between 0.65 to 1.02 mm, although the eggs of most species are less than 0.85 mm. They are characterized by a single, small oil droplet which provides buoyancy during the pelagic stage. Incubation times generally range from 17 to 27 hours depending on the species and temperature. Newly hatched larvae are sparsely pigmented, have a large yolk sac, unpigmented eyes, no mouth, and very limited swimming capabilities. The yolk reserves last for about 3 or 4 days. Perhaps the most striking feature of the larvae is the development of pronounced head spination and elongated pelvic and dorsal spines (Fig. 3). Lutjanine larvae, particularly those of Lutjanus, are most common relatively close to shore, in waters over the continental shelf or in large coral reef lagoons. They are relatively rare in the more offshore areas at the edge of the shelf and in oceanic waters where they are largely replaced by the larvae of various etelines such as Etelis and Pristipomoides. Experimental plankton tows off the northern Great Barrier Reef indicate that the lutjanid larvae constitute as much as 4 to 8% of the total fish larvae catch. Evidence from several studies indicates that the larvae are largely absent from surface waters during the day and migrate upward at night. Settlement and concurrent metamorphosis generally occurs at total lengths ranging between about 12 and 20 mm or after an estimated pelagic stage of 25 to 47 days. The maximum lifespan of snappers has been estimated between 4 and 21 years, based on studies of growth rings or bony structures such as otoliths and vertebrae. In general, the larger species have longer lifespans, perhaps in the range of 15 to 20 years. Most snappers dwell in shallow to intermediate depths (to 100 m), although the majority of etelines and some apsilines are largely confined to deep water (100 to 500 m).

Snappers are active predators feeding mainly at night on a variety of items, although fishes are dominant in the diet of most species. Other common foods include crabs, shrimps, various other crustaceans, gastropods, cephalopods, and planktonic organisms, particularly urochordates. Plankton is particularly important in the diet of eteline and apsiline genera such as Pristipomoides and Paracaesio, and of the lutjanines Ocyurus, Pinjalo and Rhomboplites. Generally, the larger, deep-bodied snappers feed on fishes and large invertebrates on or near the surface of the reef. They are usually equipped with large canine teeth, adapted for seizing and holding their prey. Snappers having a relatively slender, fusiform body shape and often a forked caudal fin, such as some members of the genera Ocyurus, Paracaesio, Pristipomoides, and Rhomboplites, consume a significant amount of plankton, and have a weaker dentition with fewer enlarged canines in the jaws.

Although snappers seldom constitute the main focus of major commercial fisheries, they are an important component of the local artisanal catch throughout their geographic range. Because of their solitary habits and territorial behaviour, the larger species are not caught in huge quantities, but nevertheless are popular eating fishes frequently sold at markets. They are captured by a variety of methods which include handlines, traps, various types of nets, and trawling gear. Because of their widespread distribution, encompassing numerous national boundaries, and the largely artisanal nature of their fisheries, there are limited catch statistics for this group.

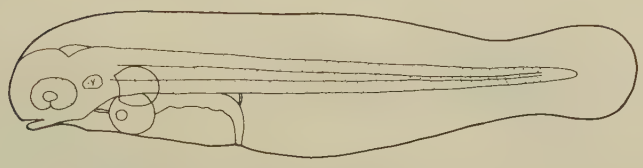
The catch of snappers for 1983 reported to FAO totalled 131 452 metric tons, of which roughly 57 000 were taken in the western central Pacific (Fishing Area 71), 28 000 in the western central Atlantic (Fishing Area 31), 13 000 in the eastern central Atlantic (Fishing Area 34), 11 720 in the southwestern Atlantic (Fishing Area 41), 9 000 in the northwestern Pacific (Fishing Area 61), 6 000 in the eastern central Pacific (Fishing Area 77), 4 000 in the western Indian Ocean (Fishing Area 51) and 3 000 in the eastern Indian Ocean (Fishing Area 52). Separate statistics were reported only for the following species: Lutjanus argentimaculatus: 9 814 metric tons (Fishing Areas 51 and 71); Lutjanus purpureus: 7 531 metric tons in Fishing Areas 31 and 41; Lutjanus campechanus: 5 514 metric tons in Fishing Area 31; Ocyurus chrysurus: 5 178 metric tons in Fishing Areas 31 and 41; Lutjanus argentiventris: 3 632 metric tons in Fishing Area 77; and Lutjanus synagris: 2 261 metric tons in Fishing Area 31. Combined statistics for the genus Lutjanus (excluding the above species) totalled 41 077 metric tons from Fishing Areas 71 (24 470 metric tons), 34 (13 094 metric tons), 57 (2 010 metric tons), 51 (613 metric tons) and 77 (389 metric tons). Finally the total catch of unidentified lutjanids (exclusive of the above categories) was 56 445 metric tons from Fishing Areas 51 (25 729 metric tons), 31 (11 382 metric tons), 61 (8 666 metric tons), 41 (3 610 metric tons), 51 (3 376 metric tons), 77 (1 988 metric tons), 57 (886 metric tons) and 87 (800 metric tons) (FAO, 1984).

The larger species, especially those in the genus Lutjanus, are much sought after by recreational anglers, particularly in the Caribbean region and off the east coast of Australia. Although highly esteemed as food, several species are sometimes implicated in cases of human fish poisoning (ciguatera), including Lutjanus bohar, L. fulvus, L. gibbus, L. monostigma and Symphorus nematophorus of the Indo-West Pacific, and Lutjanus buccanella, L. cyanopterus, L. jocu, and L. vivanus of the western Atlantic. It is believed that Lutjanus and other predatory fishes accumulate the responsible toxin by feeding on herbivorous fishes that eat a dinoflagellate found on dead coral or benthic algae.

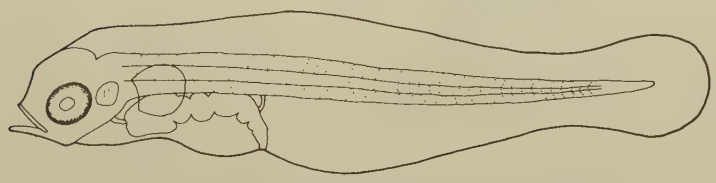


a. Lutjanus kasmira, newly hatched, 1.83 mm total length

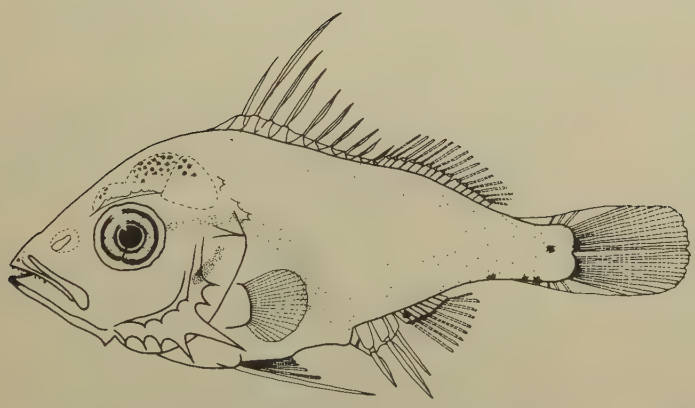
b. Lutjanus kasmira, 12 hours, 3.0 mm total length



c. Lutjanus kasmira, 24 hours, 3.2 mm total length



d. Lutjanus kasmira, 72 hours, 3.2 mm total length



e. Lutjanus sp., about 7.7 mm total length

f. Aprion virescens, 7.1 mm total length

Fig. 3 Examples of larval stages of Indo-West Pacific snappers.
a-d from Suzuki & Hioki, 1979; e. from Leis & Rennis, 1983; f. from Leis, in press

1.3 Illustrated Glossary of Technical Terms and Measurements

External Morphology and Measurements

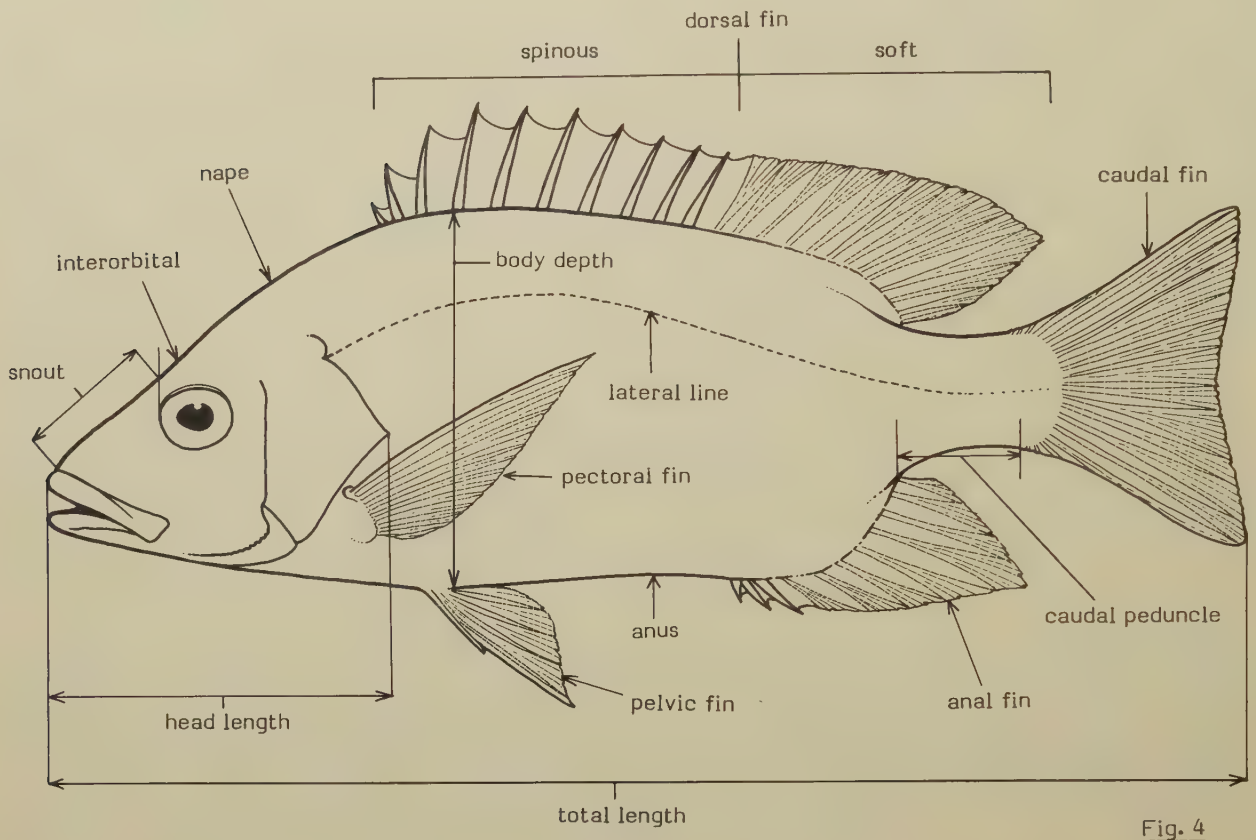


Fig. 4

Glossary of Technical Terms

Anus - The posterior external opening of the digestive tract from which waste products are excreted (Fig. 4).

Axil - The angular region between a fin and the body; usually used in reference to the underside of the pectoral fin toward the base (Fig. 5); homologous to the armpit of man.

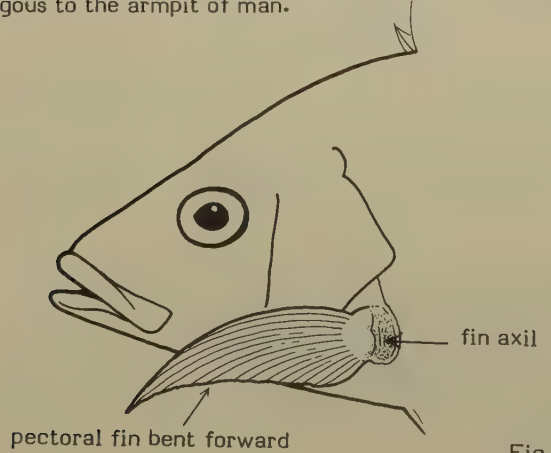


Fig. 5

Bar - An elongate colour making with vertical orientation, the sides of which are usually more or less straight (Fig. 6)

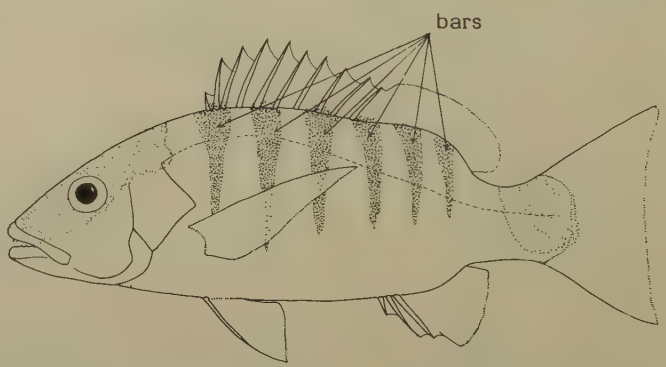
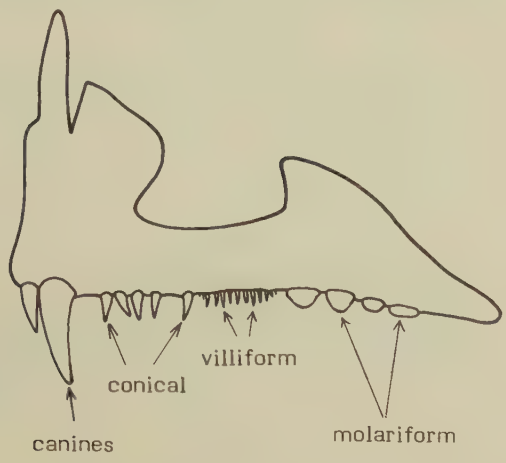


Fig. 6

Canine - A prominent fang-like, pointed tooth (Fig. 7).



Type of teeth Fig. 7

Carnivore - A flesh eating animal. Most lutjanids are classified as carnivores.

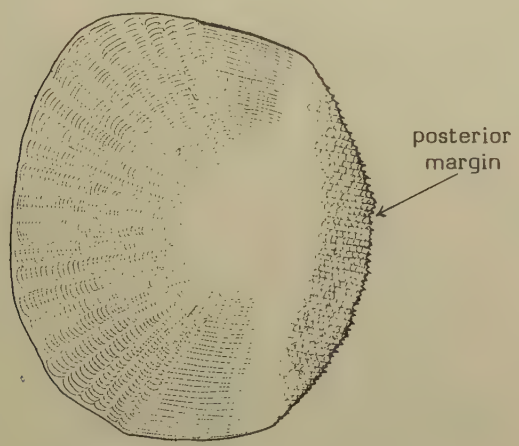
Caudal fin - The tail fin (Fig. 4).

Caudal peduncle - The narrow part of the body immediately preceding the caudal fin (Fig. 4).

Compressed - Laterally flattened; used in reference to body shape (i.e., deeper than wide).

Conical - A descriptive term for teeth that are cone-shaped (Fig. 7).

Ctenoid scales - Scales which have tiny tooth-like projections along their posterior margin (Fig. 8).



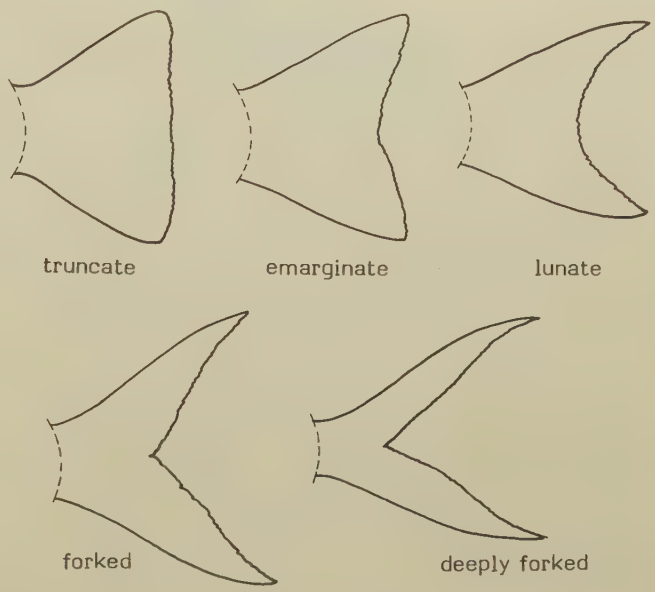
Ctenoid scale Fig. 8

Depth - A vertical measurement of the body of a fish; the greatest depth of the body (Fig. 4) is a diagnostic feature in lutjanids.

Dorsal - Toward the back or upper part of the body.

Dorsal fin - A median fin along the back; in lutjanids it is composed of spinous rays anteriorly and soft rays posteriorly (Fig. 4).

Emarginate - Concave; used to describe the shape of the posterior margin of the caudal fin (Fig. 9).



Types of caudal fin Fig. 9

Fin rays - General term for the soft rays and spines that support the fins. The spiny and soft dorsal fin rays in lutjanid fishes are continuous (Fig. 4).

Forked - Used to described a caudal fin shape with angular, pointed lobes (Fig. 9).

Fusiform - Spindle-shaped; used in reference to the body shape of a fish which is approximately cylindrical and tapers toward both ends (Fig. 10).

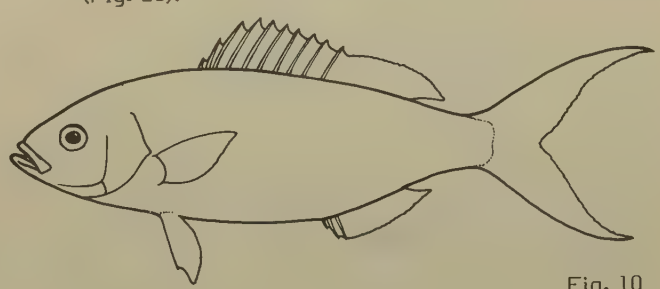
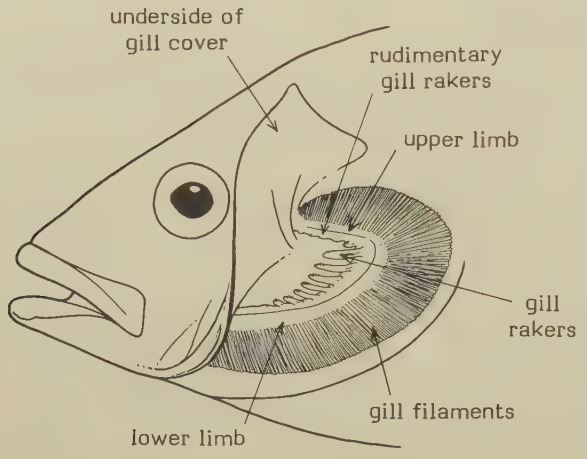


Fig. 10

Gill arch - The J-shaped structure under the gill cover that bears the gill filaments and gill rakers (see below). There are 4 gill arches on each side in lutjanids (Fig. 11).



Exposed gill arch of lutjanid fish Fig. 11

Gill rakers - Short protuberances of the gill arch on the opposite side from the red gill filaments (Fig. 11). In lutjanid fishes the number of gill rakers is often diagnostic. There is usually a series of relatively elongate, well-defined rakers, and several low, ill-defined rudiments. The rakers on the upper arch are often difficult to count without disection, therefore counts for the lower limb only as well as the total count are given.

Head length - Straight-line measurement taken from the front of the upper lip (snout tip) to the posteriormost extension of the operculum or opercular membrane (Fig. 4).

Interorbital space - The region on the top of the head between the eyes (Figs 4 and 12).

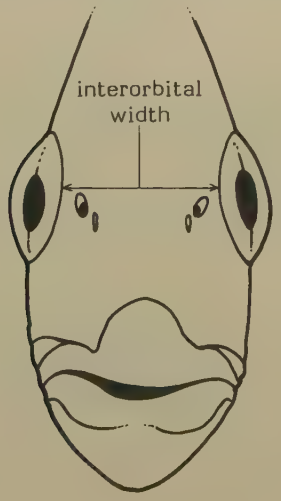


Fig. 12

Lateral - Referring to the side or directed toward the side; the opposite of medial.

Lateral-line scales - The pored or tubed scales forming a sensory canal between the upper end of the gill opening and the base of the caudal fin (Fig. 13).

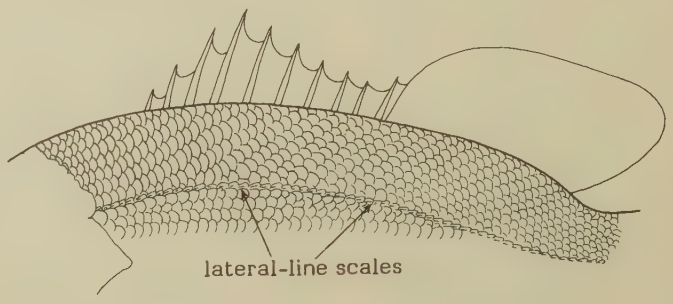
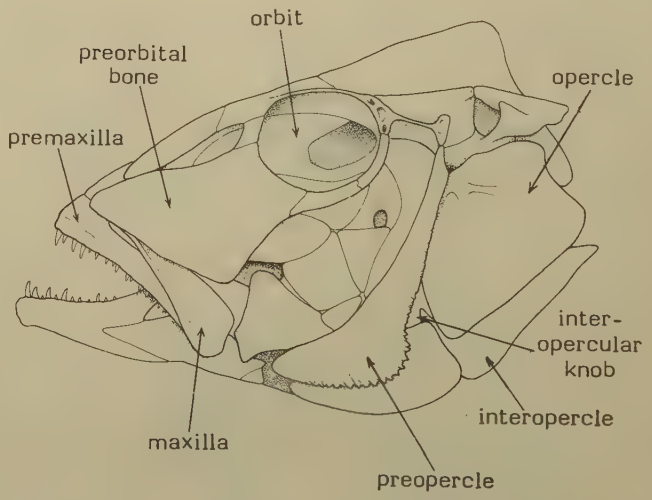


Fig. 13

Lower limb - Refers to the bottom or ventral section of the first gill arch (Fig. 11). The number of gill rakers on the lower limb is diagnostic for lutjanids.

Lunate - Sickle-shaped; used to describe a caudal fin which is deeply emarginate (Fig. 9).

Maxilla - The supporting bone for the premaxilla, the bone in the upper jaw that bears teeth (Fig. 14).



Generalized skull of Lutjanidae Fig. 14

Medial - Toward the middle or median plane of the body; opposite of lateral.

Median fins - The dorsal, anal, and caudal fins (Fig. 4).

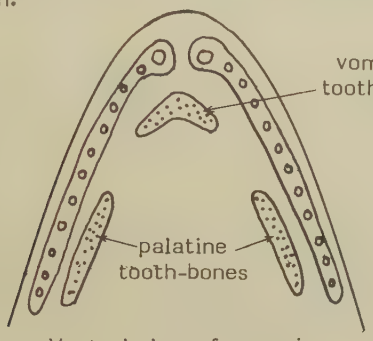
Molariform or molar-like - Tooth which is shaped like a molar (i.e. low, broad and rounded; Fig. 7).

Nape - The forehead region (Fig. 4).

Opercle - The large bone forming the upper posterior part of the gill cover (Fig. 14).

Orbit - The bony eye socket (Fig. 14).

Palatine - A paired lateral bone on the roof of the mouth lying between the vomer and the upper jaw (Fig. 15). In most lutjanids they bear a row of small teeth.

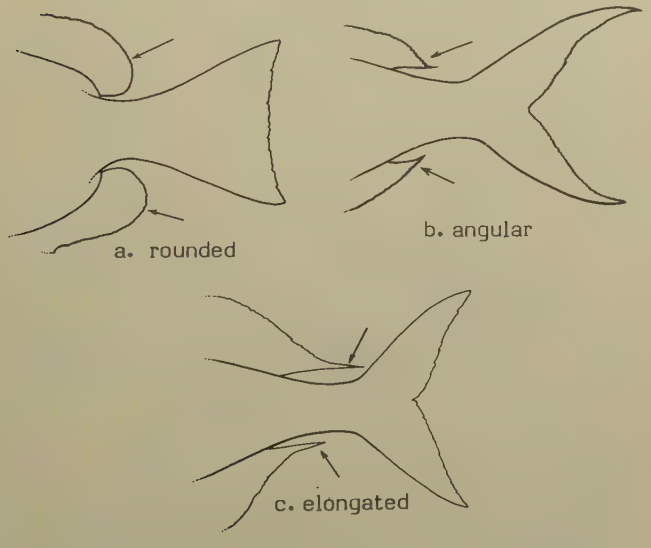


Ventral view of upper jaw Fig. 15

Pectoral fin - The fin on each side of the body immediately behind the gill opening (Fig. 4).

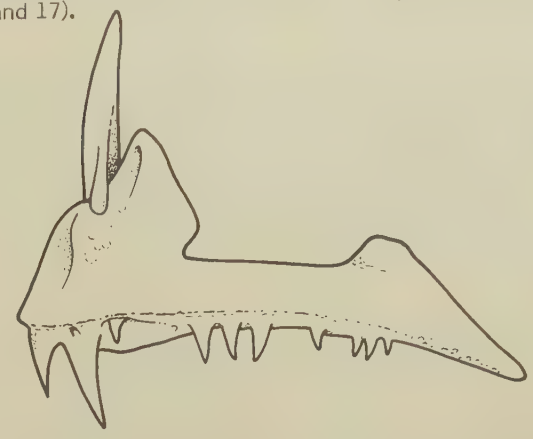
Pelvic fin - One of a pair of juxtaposed fins ventrally on the body below the pectoral fins in lutjanids (Fig. 4).

Posterior profile of dorsal and anal fins - The shape of the rear margin of these fins is a diagnostic feature in lutjanids. Generally it is rounded, angular, or distinctly pointed (Fig. 16).



Posterior profile of dorsal and anal fins Fig. 16

Premaxilla - The anterior bone of the upper jaw which bears the jaw teeth in lutjanids (Figs 14 and 17).



Premaxilla of a lutjanid Fig. 17

Preopercle - A somewhat boomerang-shaped bone, the edges of which form the posterior and lower margins of the cheek region (Fig. 14). The shape of the posterior margin is frequently diagnostic in lutjanids, particularly the presence or absence of serrations or a notch (Fig. 18). Species of Lutjanus with a pronounced preopercular notch also have a well-developed bony knob, a protuberance of the interopercle bone, lying directly opposite of and fitting into the notch (Fig. 18a).

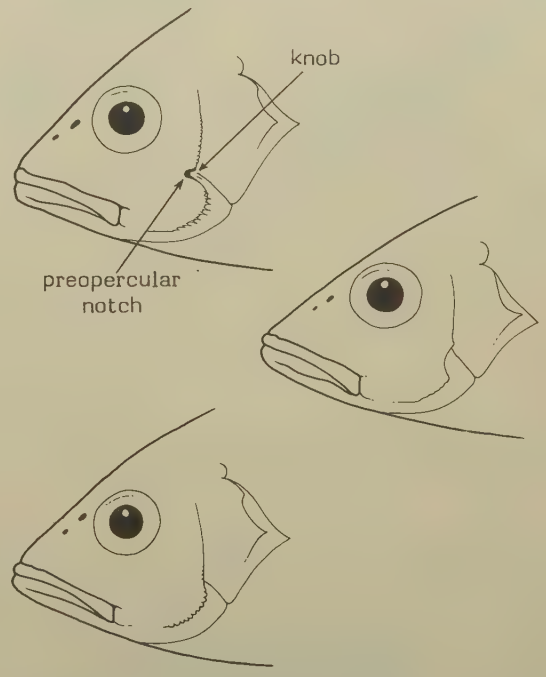


Diagram of lutjanid heads showing variation in development of preopercular notch Fig. 18

Preorbital bone - The largest of the bones forming the lower edge of the eye, located ventral and slightly anterior to the eye (Fig. 14). The width of this bone (preorbital space), measured from the upper jaw to the lower edge of the eye is frequently diagnostic for lutjanids.

Rounded - Refers to the shape of the posterior profile of the dorsal and anal fin (Fig. 16a).

Ray - The supporting bony elements of fins; includes spines and soft rays.

Rudiment - Used in reference to small nodular gill rakers at the ends of the upper and lower limbs of the first gill arch (Fig. 11).

Serrate - Series of small spinules or notches along the free margin of a bone such as the preopercle (Figs 18a,c); like the edge of a saw.

Snout - The part of the head in front of the eye. Snout length is measured from the front of the upper lip to the anterior edge of the eye (Fig. 4).

Soft ray - A segmented fin ray which is composed of two closely joined lateral elements. It is flexible and usually branched in lutjanids (Fig. 4).

Stripe - A horizontal, straight-sided colour marking, which is most often relatively narrow (Fig. 19).

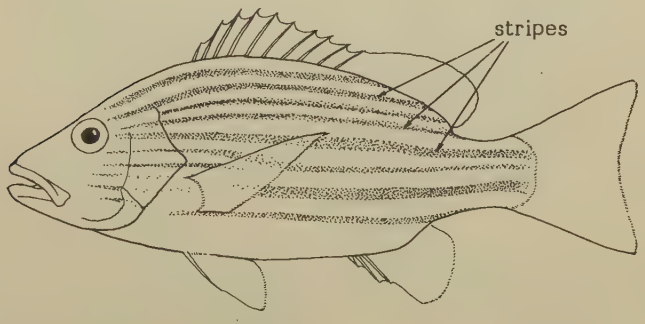


Fig. 19

Synonym - An invalid scientific name of an organism proposed after the accepted name.

Teeth - Lutjanid fishes have a variety of tooth shapes found on the upper and lower jaws, vomer, palatine, and upper surface of the tongue. The most common shapes (shown in Fig. 7) are: (1) caniniform, (2) conical, (3) villiform, and (4) molariform.

Thoracic - Referring to the chest or pectoral region.

Total length - The straight-line distance from the tip of the anteriormost jaw to a vertical line passing through the posterior tip of the longest caudal fin ray (Fig. 4).

Truncate - Square-ended; used to describe a caudal fin shape with a vertically straight posterior border (Fig. 9).

Upper profile of head - Refers to the shape of the head in lateral view from the beginning of the dorsal fin to the tip of the snout. The steepness of the snout profile is often diagnostic for lutjanids (Fig. 4).

Ventral - Toward the lower part of the body; the opposite of dorsal.

Villiform - Numerous, small slender projections; used to describe bands of small, close-set, slender teeth (Fig. 9).

Vomer - A median unpaired bone toward the front of the roof of the mouth (Fig. 15); almost always bearing a patch of villiform teeth in lutjanids.

Vomerine tooth patch - The group of villiform (except molar-like in Hoplopagrus) teeth located anteriorly on the roof of the mouth (Fig. 15). The shape of the tooth patch varies greatly in lutjanid fishes and is frequently diagnostic (Fig. 20).

Shapes of the vomerine tooth-patch in lutjanid fishes

Fig. 20

2. SYSTEMATIC CATALOGUE

2.1 Illustrated Key to Genera and Monotypic Species

1a. Base of dorsal and anal fins, especially soft portions, with covering of scales (Fig. 1)

2a. Anterior part of roof of mouth (vomer) with a patch of small teeth (Fig. 2), usually crescentic, V-shaped, triangular, anchor-shaped, or diamond-shaped; anterior portion of soft dorsal and anal fins not significantly taller than posterior part, the anterior fin rays never produced into elongate filaments (Figs 4, 6, 7, 10, 11, 13)

3a. Gill rakers long and slender, very numerous, more than 50 on lower limb of first gill arch (Fig. 3a) ..... **Macolor** (Fig. 4)

3b. Gill rakers shorter, less than 25 on lower limb (Fig. 3b)

4a. Teeth in jaws conical to molariform, short and stout; vomerine teeth usually less than 5, relatively large and molariform; anterior nostril opening through a tube above the upper lip (Fig. 5a) ..... **Haplopagrus** (Haplopagrus guntheri only) (Fig. 6)

4b. Teeth in jaws more elongate, villiform to caniniform; vomerine teeth numerous and villiform; anterior nostril not opening through a tube (Fig. 5b)

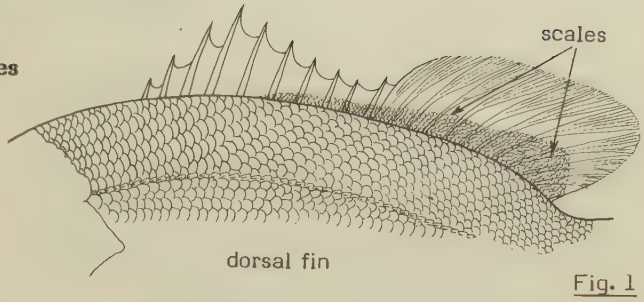


Fig. 1

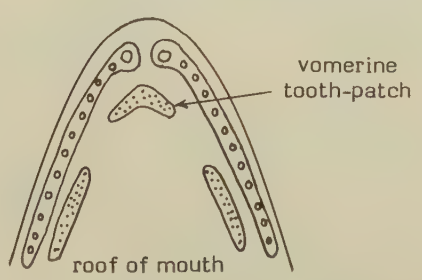
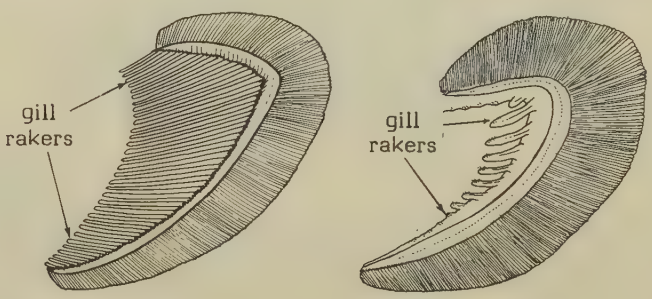
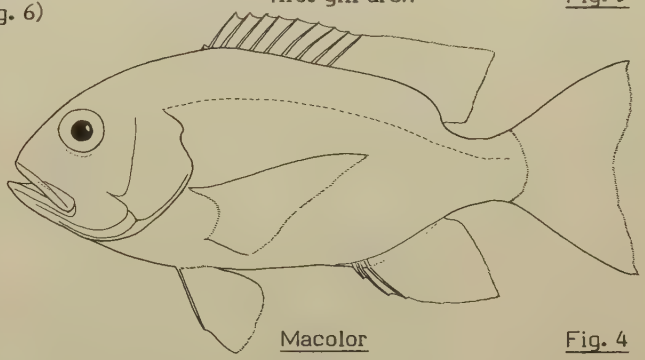
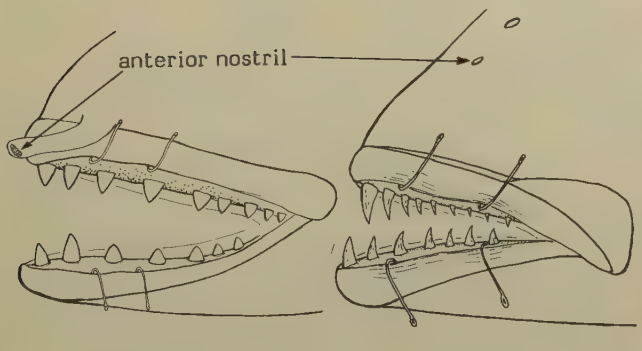


Fig. 2



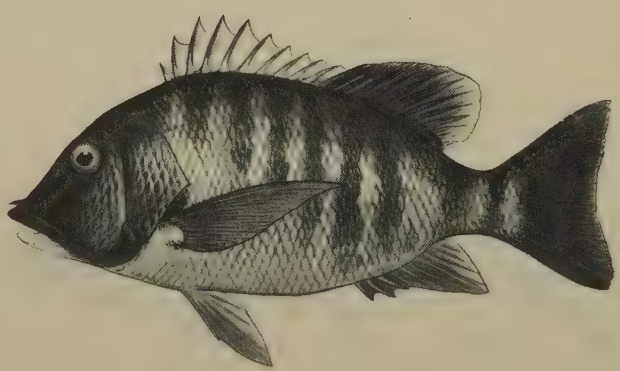
a. Macolor b. typical Lutjanus first gill arch
Fig. 3


Macolor
Fig. 4



a. jaws of Haplopagrus (lips pulled back and partially dissected)

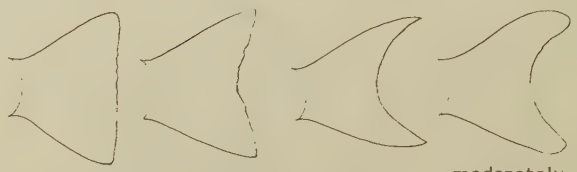
b. jaws of Lutjanus sp. (lips pulled back and partly dissected)
Fig. 5


Haplopagrus guntheri
Fig. 6

5a. Caudal fin deeply forked with pointed lobes, body relatively slender and fusiform; gill rakers on lower limb of first arch (including rudiments) 21 to 23; western Atlantic distribution ..... **Ocyurus** (Ocyurus chrysurus only) (Fig. 7)

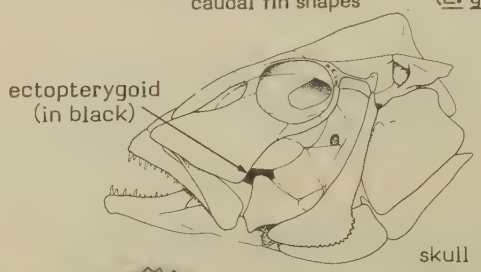
Ocyurus chrysurus Fig. 7

5b. Caudal fin truncate to emarginate or lunate (except moderately forked in Lutjanus gibbus, which has rounded lobes) (Fig. 8); body shape variable, very deep to slender; gill rakers variable, but usually less than 20 in most species



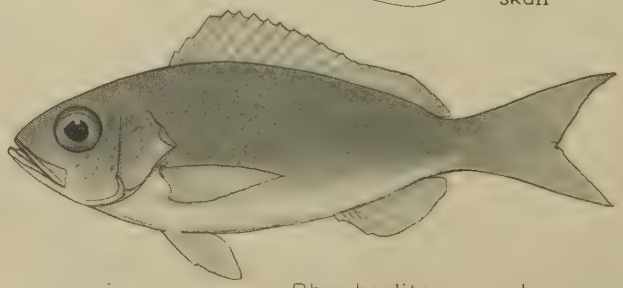
caudal fin shapes Fig. 8

6a. Dorsal spines 12; gill rakers on lower limb of first arch 19 to 22; no enlarged canine teeth in jaws; ectopterygoid bones (Fig. 9) with villiform teeth; western Atlantic distribution .....**Rhomboplites** (Rhomboplites aurorubens only) (Fig. 10)



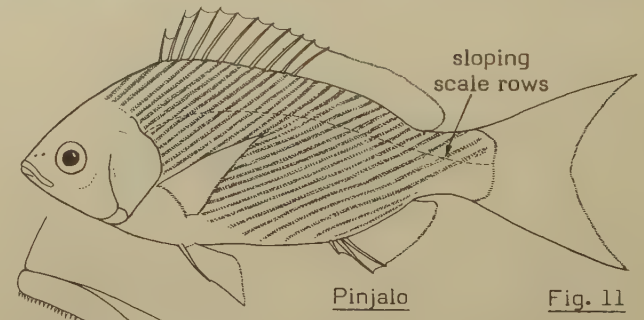
skull Fig. 9

6b. Dorsal spines 10 to 12 (10 or 11 in most species); gill rakers on lower limb of first arch 20 or less (less than 16 in most species); jaws usually with enlarged canines anteriorly (except in Pinjalo); ectopterygoid bones (Fig. 9) toothless; Indo-Pacific and Atlantic distributions



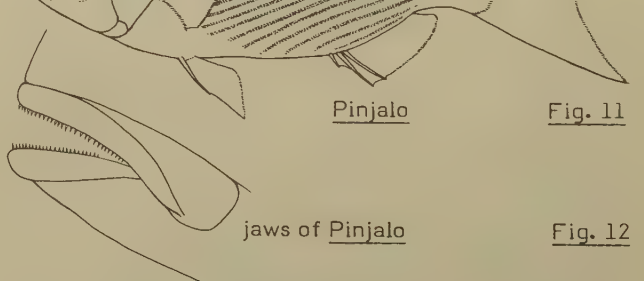
Rhomboplites aurorubens Fig. 10

7a. Upper and lower profiles of head equally rounded; eye set toward middle of head, its lower edge below line from snout tip to middle of caudal fin base; longitudinal scale rows below lateral line sloping upward in posterior direction; no fang-like canines at front of jaws although they may be slightly enlarged compared to lateral jaw teeth (Fig. 12) .....**Pinjalo** (Fig. 11)

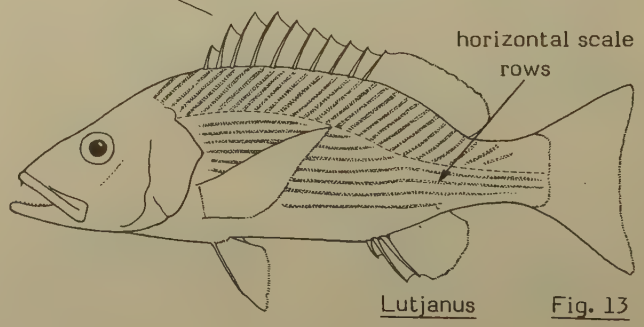


Pinjalo Fig. 11

7b. Upper and lower profiles of head unequal, upper profile evenly rounded to steeply sloped, and lower profile flattened; eye closer to upper profile of head, its lower edge generally above line from snout tip to middle of caudal fin base; longitudinal scale rows below lateral line usually horizontal (except sloping upward in L. erythropterus and L. gibbus); some fang-like canines usually present at front of jaws (Fig. 5b) ..... **Lutjanus** (Fig. 13)



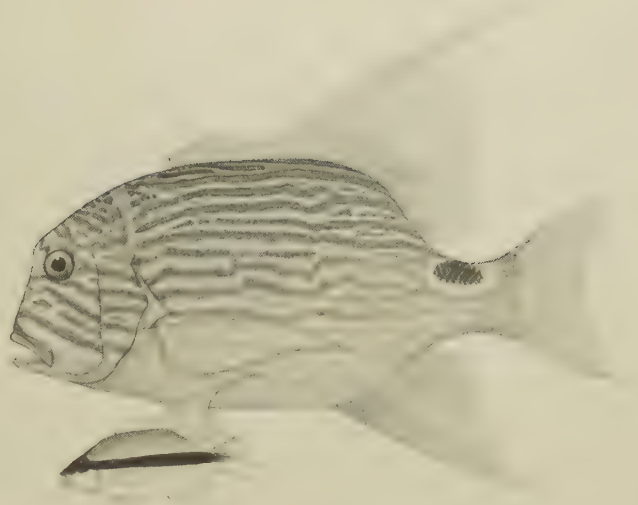
jaws of Pinjalo Fig. 12



Lutjanus Fig. 13

2b. Anterior part of roof of mouth (vomer) without a patch of teeth; anterior portion of soft dorsal and anal fins elevated, much taller than posterior part, third through sixth soft rays of dorsal fin and second through fourth soft rays of anal fin produced into elongate filaments, at least in juveniles and subadults

8a. Snout steeply sloped, vertical or nearly so, with a distinct interorbital hump, at least in adults; no groove or pit between eye and nostrils..... **Symphorichthys** (Symphorichthys spilurus only) (Fig. 14)



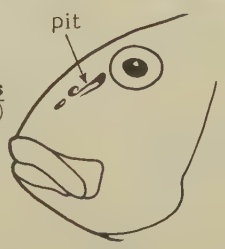
Symphorichthys spilurus Fig. 14

8b. Snout more rounded, not vertical or nearly so, without an interorbital hump; a groove or pit in the region between front of eye and nostrils ..... **Symphorus** (Symphorus nematophorus only) (Fig. 15)

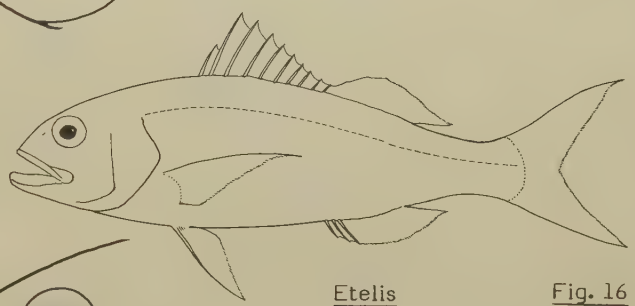
Symphorus nematophorus Fig. 15

1b. Base of dorsal and anal fins entirely scaleless

9a. Dorsal fin deeply notched between spinous and soft portions; maxilla scaled ..... **Etelis** (Fig. 16)



9b. Dorsal fin not deeply notched between spinous and soft portions (Figs 17, 18, 21, 22, 24, 27, 28); maxilla usually scaleless (except scaled in Parapristipomoides and some species of Paracaesio)



Etelis Fig. 16

10a. Pectoral fins short, about equal to snout length; a distinct groove in front of eye ..... **Aprion** (Aprion virescens only) (Fig. 17)

10b. Pectoral fins much longer than snout length (Figs 18, 21, 22, 24, 25, 27, 28); no groove in front of eye

Aprion virescens Fig. 17

11a. Roof of mouth toothless; teeth in jaws minute, no enlarged canines ..... **Aphareus** (Fig. 18)

11b. Roof of mouth with villiform teeth on vomer and palatines (Fig. 19); teeth in jaws larger, usually with enlarged canines at front (except in Parapristipomoides)

12a. Last ray of dorsal and anal fins conspicuously longer than preceding rays, usually produced into an elongate extension; interorbital space flattened (Fig. 20a) ..... **Pristipomoides** (Fig. 21)

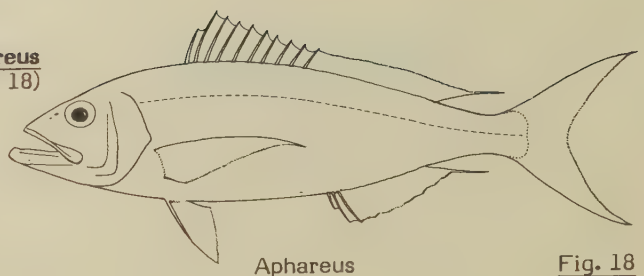
12b. Last ray of dorsal and anal fin shorter than penultimate ray or only slightly longer, not forming a conspicuous filament; interorbital space convex (Fig. 20b), except somewhat flattened in Lipocheilus

13a. Maxilla with a well-developed series of bony ridges on lateral surface; premaxilla (upper jaw) not protractile .. **Randallichthys** (Randallichthys filamentosus only) (Fig. 22)

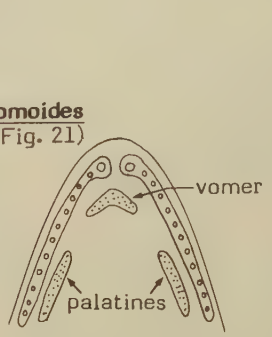
13b. Maxilla without bony ridges on lateral surface; premaxilla (upper jaw) protractile

14a. Upper lip with a median fleshy protuberance (Fig. 23), especially well developed in adults, mouth relatively large; dorsal spines thick, robust ..... **Lipocheilus** (Lipocheilus carnolabrum only) (Fig. 24)

14b. Upper lip without a fleshy protuberance, mouth smaller; dorsal spines relatively feeble to moderately developed

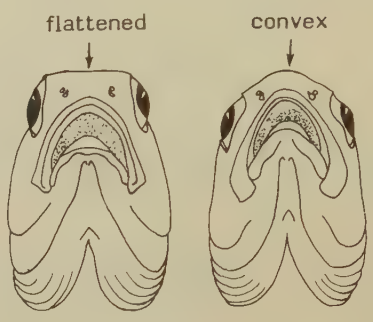


Aphareus Fig. 18



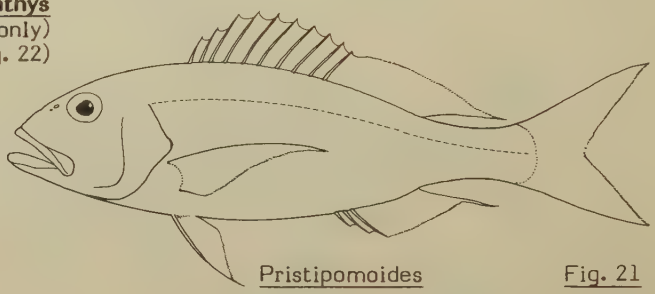
vomerine tooth-path on roof of mouth

Fig. 19

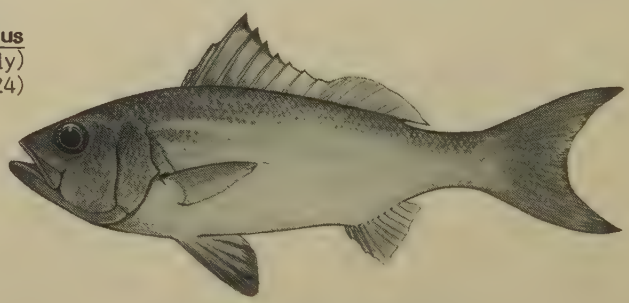


schematic front views of head

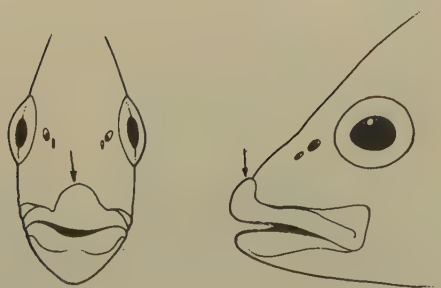
Fig. 20



Pristipomoides Fig. 21



Randallichthys filamentosus Fig. 22



frontal view lateral view

head of Lipocheilus carnolabrum Fig. 23

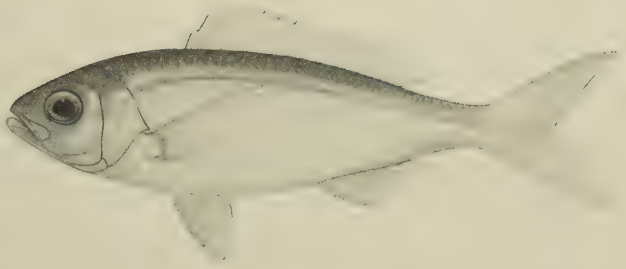
Lipocheilus carnolabrum Fig. 24

15a. Canine teeth absent from jaws; premaxilla scaled (as in Fig. 16); interorbital space slightly arched; southeastern Oceania distribution (Easter Island and Rapa) ..... **Parapristipomoides** (Parapristipomoides squamimaxillaris only) (Fig. 25)

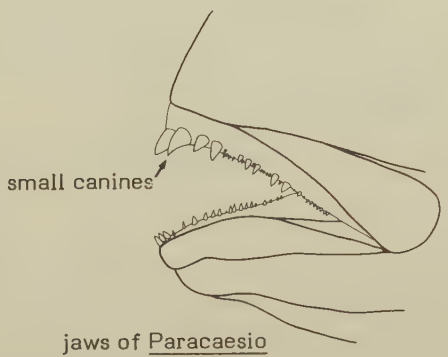
15b. Canine teeth present in jaws (although they may be only slightly enlarged) (Fig. 26); interorbital space strongly arched (Fig. 20b); Indo-Pacific or Atlantic distribution

16a. Upper and lower profiles of head evenly rounded; eye positioned toward middle of head, centered near line passing from snout tip to middle of caudal fin base; snout blunt; maxilla with or without scales; Indo-Pacific distribution ..... **Paracaesio** (Fig. 27)

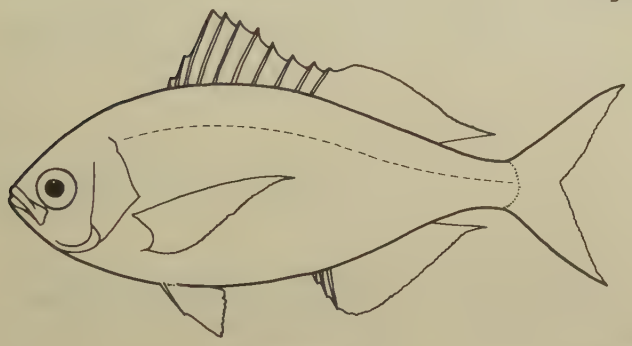
16b. Upper and lower profiles of head uneven, somewhat flattened on ventral surface; eye positioned closer to upper profile, the pupil or entire eye above line passing from snout tip to middle of caudal fin base; snout more pointed; maxilla without scales; Atlantic distribution ..... **Apsilus** (Fig. 28)



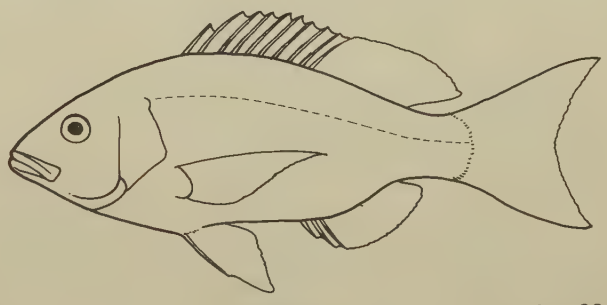
Parapristipomoides squamimaxillaris Fig. 25



jaws of Paracaesio Fig. 26



Paracaesio Fig. 27



Apsilus Fig. 28

2.2 Information by Species

Aphareus Cuvier, 1830 — LUT Aph

Genus : Aphareus Cuvier, 1830:485. Type-species Aphareus caerulescens Cuvier (in C. & V.), 1830 (= Labrus furcatus Lacepède, 1802), by subsequent designation of Jordan, Tanaka & Snyder, 1913.

Synonyms : Genus Sacrestinus Evermann & Tanaka, 1927; Genus Fares Jordan, Evermann & Tanaka, 1927; Genus Humefordia Whitley, 1931.

Diagnostic Features : Medium-sized snappers with elongate, fusiform body, somewhat robust. Teeth in jaws minute, no canines; vomerine teeth absent; premaxillae not protractile; gill openings extending well forward of front of eye; interorbital space flattened. Dorsal fin continuous, not incised near junction of spinous and soft portions, with 10 spines and 11 (rarely 10) soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins long, slightly shorter than head, with 15 or 16 rays; dorsal and anal fins scaleless; caudal fin forked. Scales relatively small, about 65 to 75 in lateral line. Colour: purplish-brown, blue-grey, or reddish, sometimes with a silvery sheen on lower sides and belly.

Biology, Habitat and Distribution : A dweller of coral reefs and rocky bottom areas from depths of about 6 m to at least 100 m. They occur solitarily or in small groups, swimming well above the bottom.

Geographical Distribution : Inshore waters throughout the tropical Indo-West Pacific.

Interest to Fisheries : Aphareus species are an important foodfish, particularly in insular areas. They are caught mainly with handlines or bottom longlines. The flesh is of good quality and generally marketed fresh.

Key to the species of Aphareus :

1a. Gill rakers on first arch 5 or 6 + 16 to 18 ..... **A. furcatus**

1b. Gill rakers on first arch 16 to 19 + 30 to 34 ..... **A. rutilans**

Aphareus furcatus (Lacepède, 1802) — LUT Aph 1

Labrus furcatus Lacepède, 1802, Hist.Nat.Poiss., 3:429, 447 (Great Ocean = Mauritius).

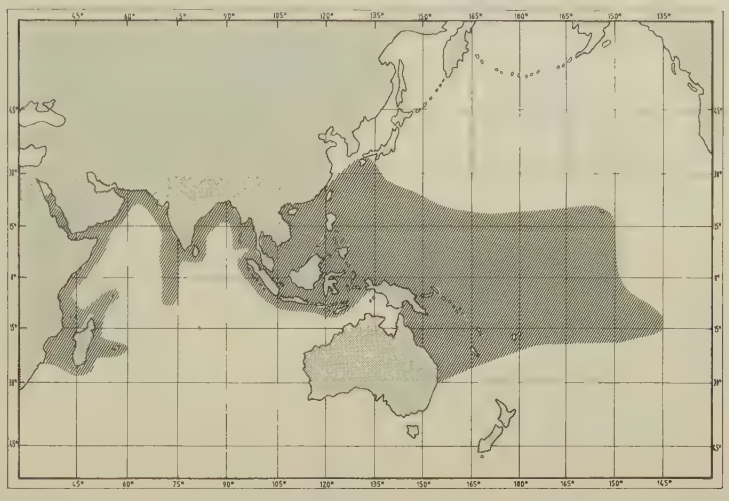
Synonyms : (From Fowler, 1931). Caranxomorus sacrestinus Lacepède (1803); Aphareus caerulescens Cuvier (1830); Aphareus flavivultus Jenkins (1901).

FAO Names : En - Small toothed jobfish; Fr - Vivaneau tidents; Sp - Pargo boquidulce.

See Plate X, 36

Diagnostic Features : Body elongate, fusiform, and compressed. Lower jaw protruding; maxilla extending to below middle of eye; interorbital space flattened; teeth in jaws small, disappearing with age; roof of mouth toothless; gill rakers on lower limb (including rudiments) 16 to 18. Dorsal fin with 10 spines and 11 (rarely 10) soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins long reaching to about level of anus with 15 or 16 rays; caudal fin forked; dorsal and anal fins scaleless. Scales small, about 65 to 75 in lateral line; scale rows on back parallel with lateral line. Colour: back and upper sides purplish-brown; blue-grey on sides; a silvery sheen on head and lower sides; edges of preopercle and opercle outlined with black; fins whitish to yellow-brown.

Geographical Distribution : Widespread in the tropical Indo-Pacific Ocean from the Hawaiian Islands to East Africa, and from southern Japan southward to Australia.



Habitat and Biology : Inhabits inshore coral reefs at depths between about 6 and 70 m. Occurs solitarily or in small groups. Feeds mainly on fishes, but also eats crustaceans.

Size : Maximum total length about 40 cm; common to 30 cm.

Interest to Fisheries : Often seen in markets. Caught mainly with handlines or vertical longlines; also speared by divers. Marketed fresh.

Local Names : ELLICE ISLANDS: Te balusenga; GILBERT ISLANDS: Te ikakoa; GUAM: Gurutsu; HAWAII: Gurutsu; JAPAN: Ishifuedai; NEW CALEDONIA: Aphareus bleuâtre; PALAU: Krong; SAMOA: Palu-aloalo; TAHITI: Paru; TANZANIA: Sare-sare; TUAMOTUS (Raroia): Tahakari.

Literature : Fowler (1931); Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Remarks : The original spelling for the species name is "furca" (W.D. Anderson, pers.comm.), but "furcatus" has been extensively used in the literature.

Aphareus rutilans Cuvier, 1830

LUT Aph 2

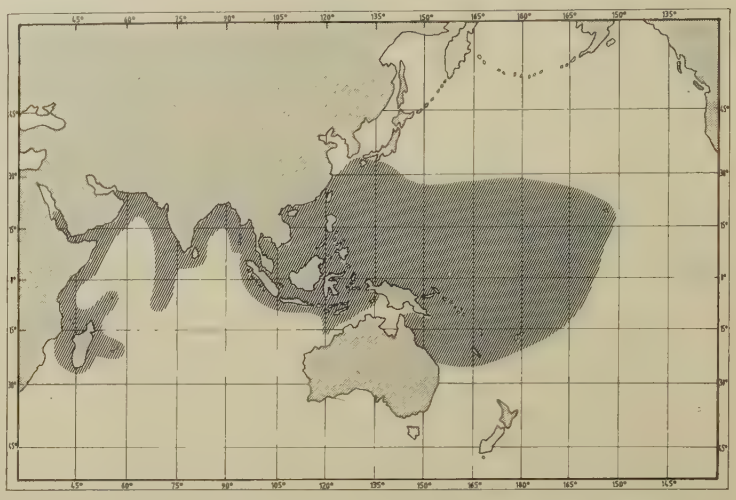
Aphareus rutilans Cuvier, 1830, Hist.Nat.Poiss., 6:490 (Red Sea).

Synonyms : (From Fowler, 1931). Aphareus thompsoni Fowler (1923).

FAO Names : En - Rusty jobfish; Fr - Vivaneau rouillé; Sp - Pargo bermellón.

See Plate X, 37

Diagnostic Features : Body elongate, fusiform and compressed. Lower jaw protruding; maxilla extending to below middle of eye; interorbital space flattened; teeth small, forming narrow uniform band in each jaw; roof of mouth toothless; gill rakers on lower limb (including rudiments) 30 to 34. Dorsal fin with 10 spines and 11 (rarely 10) soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins long, reaching to about level of anus, with 15 or 16 rays; caudal fin deeply forked; dorsal and anal fins scaleless. Scales small, about 70 to 73 in lateral line; scale rows on back parallel with lateral line. Colour: blue-grey or mauve to overall reddish; fins yellowish to reddish except pelvics and anal fin sometimes whitish; margin of maxilla black.



Geographical Distribution : Widespread in the tropical Indo-Pacific Ocean from the Hawaiian Islands to East Africa, and from the Ryukyu and Bonin Islands southward to Australia. At Vanuatu (New Hebrides) spawning occurs mainly during spring and summer, with peak activity in November and December.

Habitat and Biology : Inhabits reefs and rocky bottom areas to depths of at least 100 m.

Size : Maximum total length about 80 cm; common to 50 cm.

Interest to Fisheries : Locally abundant and an important market fish in some areas. It is one of the principal species in the Hawaiian offshore handline fishery (about 7.4 metric tons and revenue of US$ 37 500 in 1984). Caught with handlines and bottom longlines. Marketed fresh.

Local Names : AUSTRALIA: Small-toothed jobfish; GILBERT ISLANDS: Te bukinrin; GUAM: Lehi; JAPAN: Oguchi-ishichibiki; PALAU: Metngui; SAMOA: Palu-gutusiliva; SOUTH AFRICA: Kleintand-jobvis, Small tooth jobfish; THE PHILIPPINES: Binluan, Bisu-gong-buhangin, Sagisi.

Literature : Fowler (1931); Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Aprion Valenciennes, 1830

LUT Apri

Genus : Aprion Valenciennes (in C. & V.), 1830:543. Type-species Aprion virescens Valenciennes (in C. & V.), 1830, by monotypy.

Synonyms : Genus Sparopsis Kner, 1868.

A single species in the genus - see Aprion virescens.

Aprion virescens Valenciennes, 1830

LUT Apri 1

Aprion virescens Valenciennes (in C. & V.), 1830, Hist.Nat.Poiss., 6:544 (Seychelles).

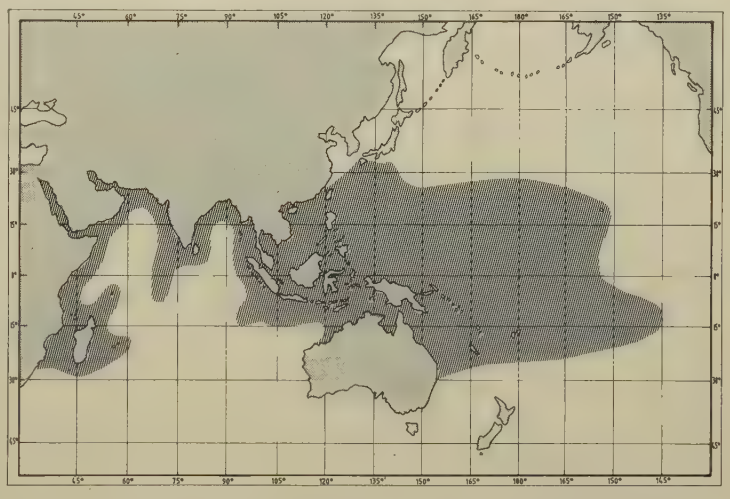
Synonyms : (From Fowler, 1931). Mesoprion microchir Bleeker (1853); Sparopsis latifrons Kner (1868); Sparopsis elongatus Kner (1868); Aprion konekonis Tanaka (1914).

FAO Names : En - Green jobfish; Fr - Vivaneau job; Sp - Pargo verde.

See Plate X, 38

Diagnostic Features : An elongate, robust fish with rounded body (in cross section). Preopercular edge smooth or sometimes denticulate in juveniles; a distinct horizontal groove in front of eye; teeth in both jaws in bands, with 2 strong canines anteriorly; vomerine tooth patch crescent-shaped. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; gill rakers on lower limb (including rudiments) 14 or 15. Pectoral fins short, rounded, about equal to snout length with 17 rays; caudal fin deeply forked, with pointed lobes; dorsal and anal fins scaleless. Scales moderate-sized, about 48 to 50 in lateral line; scale rows on back parallel with lateral line. Colour: dark green to bluish or blue-grey.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from Hawaii to East Africa and southern Japan southward to Australia.



Habitat and Biology : Inhabits inshore reef areas, from the surface down to 100 m depth. Usually seen solitarily. Feeds mainly on fishes, but also on shrimps, crabs, cephalopods and planktonic organisms. Spawning has been recorded in January and November off East Africa.

Size : Maximum total length about 100 cm; common to about 60 cm.

Interest to Fisheries : Important in certain subsistance fisheries and frequently seen in markets. It is one of the principal species in the Hawaiian offshore handline fishery (about 72 metric tons, and a revenue of US$ 362 500 in 1984. Caught mainly with trolled lures, handlines, bottom longlines, and bottom trawls. Marketed mostly fresh; also dried and salted. Excellent eating.

Local Names : AUSTRALIA: Green job-fish; ELLICE ISLANDS: Te utu; GILBERT ISLANDS: Te awai; GUAM: Uku; HAWAII: Uku; JAPAN: Aochibiki; NEW CALEDONIA: Aprion verdâtre; PALAU: Udel; SAMOA: Asoama; SOUTH AFRICA: Kaakap, Green jobfish; SRI LANKA: Dhialava (S), Dhiula (T); TAHITI: Utu; TANZANIA: Changu-fimbo, Fimbo, Kifimbo; THE PHILIPPINES: Guntol.

Literature : Fowler (1931); Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Apsilus Valenciennes, 1830

LUT Apsi

Genus : Apsilus Valenciennes (in C. & V.), 1830:548. Type-species Apsilus fuscus Valenciennes (in C. & V.), 1830, by monotypy).

Synonyms : None.

Diagnostic Features : Medium-sized snappers, with moderately deep to slender, robust, fusiform bodies. Teeth of jaws relatively small, villiform or conical, arranged in bands, outer row sometimes enlarged; vomerine patch V-shaped without medial posterior extension; interorbital space broad and convex. Dorsal fin continuous, not incised near junction of spinous and soft portions, with 10 spines and 9 or 10 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fin rays 15; dorsal and anal fins scaleless; caudal fin forked or emarginate. Scales medium-sized to relatively small, about 58 to 68 in lateral line. Colour: overall dark brown or violet, lighter on lower sides and belly.

Biology, Habitat and Distribution : A dweller of moderately deep water (about 30 to 300 m depth), usually over rocky bottoms. Found mostly solitary or in small groups. The diet consists of small fishes, squids, benthic crustaceans, and also larger zooplankton.

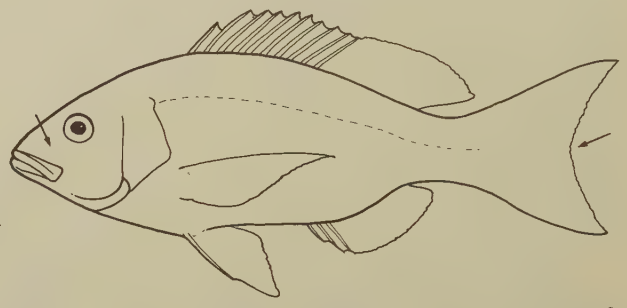
Geographical Distribution : Primarily the tropical Atlantic Ocean with a few records from the western Indian Ocean, mainly from East Africa.

Interest to Fisheries : Separate statistic are not reported for these fishes. They do not appear to be caught in significant numbers, although the flesh is good eating. Cuba seems to be the only locality where they are regularly seen in markets, usually offered fresh. They are caught mainly with handlines (both single and multiple); also with setnets and trawls.

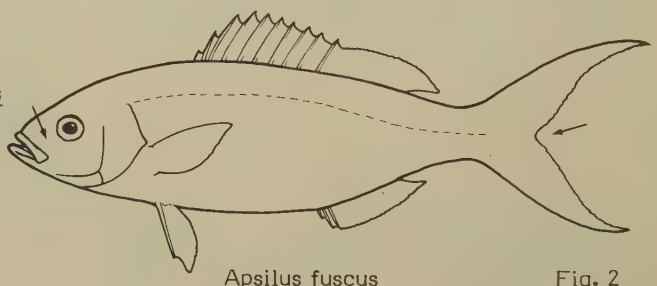
Key to the species of Apsilus :

1a. Caudal fin emarginate; body relatively deep; its greatest depth about 2.6 to 2.8 in standard length (Fig. 1); pectoral rays 15 or 16; preorbital depth about equal to eye diameter; scales in lateral line 58 to 63; gill rakers on lower limb (excluding rudiments of first arch 15 or 16; confined to the western Atlantic ..... **A. dentatus**

1b. Caudal fin deeply forked; body slender, its greatest depth about 3.2 to 3.6 in standard length (Fig. 2); pectoral rays 17 or 18; preorbital depth significantly smaller than eye diameter; scales in lateral line 62 to 68; gill rakers on lower limb of first arch 20 to 23; confined to the eastern Atlantic ..... **A. fuscus**



Apsilus dentatus Fig. 1



Apsilus fuscus Fig. 2

Apsilus dentatus Guichenot, 1853

LUT Apsi 1

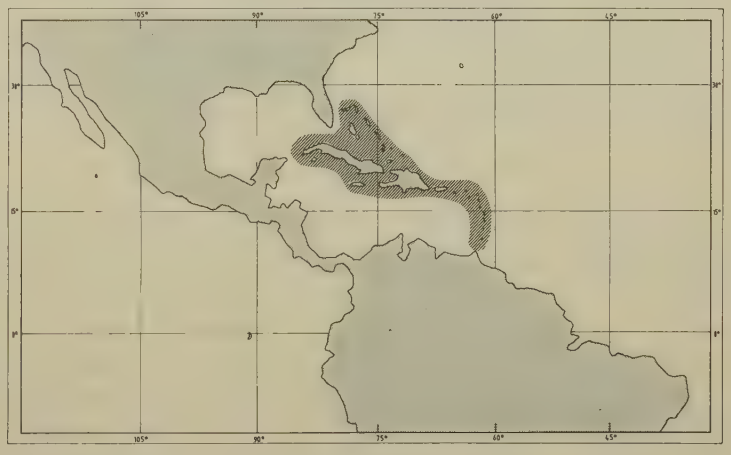
Apsilus dentatus Guichenot (in Ramon de la Sagra, 1853), Hist.Cuba Poiss., 29 (Havana, Cuba).

Synonyms : Mesoprion arnillo Poey (1860).

FAO Names : En - Black snapper; Fr - Vivaneau noir; Sp - Pargo mulato.

See Plate I, 1

Diagnostic Features : Body oblong, relatively deep. Head relatively small, interorbital space convex; snout relatively short and pointed; both jaws with an inner band of villiform teeth and an outer band of larger teeth; anterior teeth in upper jaw enlarged, canine-like; vomerine tooth patch V-shaped, without a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 15 or 16. Dorsal fin with 10 spines and 9 or 10 soft rays, anal fin with 3 spines and 8 soft rays; dorsal and anal fin bases scaleless; pectoral fins long, reaching level of anus, with 15 or 16 rays; caudal fin forked. Scales in lateral line 58 to 63; scale rows on back parallel to lateral line. Colour: back and upper sides violet or dark brown, more intense on head; lower sides and belly paler. Juveniles are mainly blue.



Geographical Distribution : Tropical western Atlantic Ocean. Restricted to the Antilles and Bahamas.

Habitat and Biology : Inhabits mainly rocky bottoms between about 120 and 180 m depth. Young sometimes found near the surface. Feeds on fishes and bottom-dwelling animals, including cephalopods and tunicates. Spawning occurs during most of the year, with peak activity during February, April, September/October and November at Jamaica.

Size : Maximum total length about 65 cm; common to 40 cm. Matures at about 40 to 50 cm.

Interest to Fisheries : Limited interest at present, but has potential for future fishery. Caught mainly with single and multiple handlines. Marketed mainly fresh, sometimes frozen. Flesh of good quality.

Local Names : CUBA: Arnillo, Pargo mulato; PUERTO RICO: Chopa negra.

Literature : Jordan & Evermann (1896); Anderson (1967).

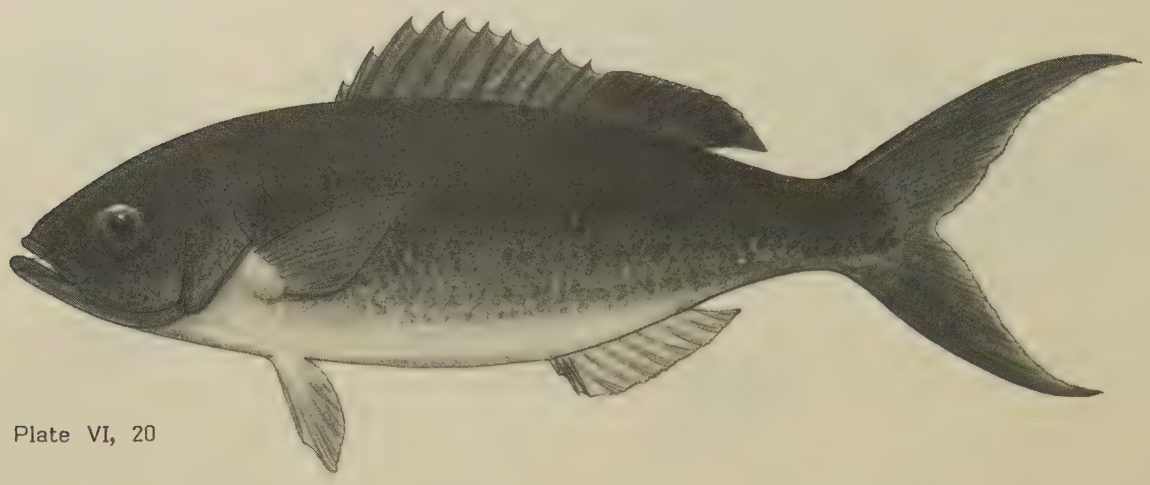
Apsilus fuscus Valenciennes, 1830

LUT Apsi 2

Apsilus fuscus Valenciennes (in C. & V., 1830), Hist.Nat.Poiss., 6:413 (Porto Praya, Cape Verde Islands).

Synonyms : None.

FAO Names : En - African forktail snapper; Fr - Vivaneau fourche (d'Afrique); Sp - Pargo tijera.



See Plate VI, 20

Diagnostic Features : Body moderately elongate, fusiform; maxilla extending posteriorly to below front of eye; teeth in jaws all villiform, no enlarged canines; vomerine tooth patch V-shaped, without a medial posterior extension; interorbital space broad and convex; gill rakers on lower limb 20 to 23. Dorsal fin with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fin bases scaleless; pectoral fins shorter than head and not reaching level of anus, with 17 or 18 rays; caudal fin strongly forked. Scales in lateral line about 62 to 68; scale rows on back parallel to lateral line. Colour: back and sides dark brown, lighter on belly and underside of head.

Geographical Distribution : Tropical and subtropical coast of West African from Mauritania southward. Records of this species from the western Indian Ocean are probably based on misidentification.

Habitat and Biology : Inhabits depths between about 30 and 300 m. Feeds on small fishes, squids and crustaceans.

Size : Maximum total length 75 cm; common to 60 cm.

Interest to Fisheries : Of potential interest to fisheries, but caught in relatively low numbers. Taken with handlines, set nets, and bottom trawls. Marketed mainly fresh. Flesh of good quality.

Local Names : SENEGAL: Mbeureugane.

Literature : Smith (1949); Fischer, Bianchi & Scott (eds) (1981); Fischer & Bianchi (eds) (1984).

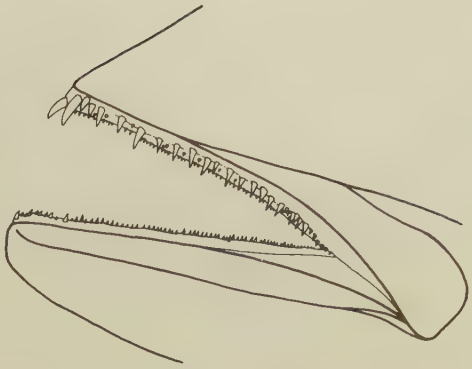
Etelis Cuvier, 1828

LUT Etel

Genus : Etelis Cuvier (in C. & V.), 1928:127. Type-species Etelis carbunculus Cuvier (in C. & V.), 1828, by monotypy.

Synonyms : Genus Eteles Swainson, 1839; Genus Elastoma Swainson, 1839; Genus Hesperanthias Lowe, 1843; Genus Macrops Duméril, 1856; Genus Etelides Jordan & Thompson, 1905; Genus Etelinus Jordan & Thompson, 1911.

Diagnostic Features : Medium-sized snappers with slender, fusiform bodies. Teeth of jaws small, conical, the outer row enlarged, and frequently with 1 or 2 pair of enlarged canines anteriorly (see figure); vomerine tooth patch V-shaped or arched, without a medial posterior extension; interorbital space flattened. Dorsal fin continuous, but spinous portion of fin incised at its junction, soft portion with 10 spines and 11 (rarely 10) soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; last dorsal and anal rays longer than penultimate soft rays; pectoral fins long, slightly shorter than head, with 15 to 17 rays; caudal fin forked. Scales medium-sized, about 47 to 53 in lateral line; maxilla covered with scales. Colour: various shades of red or pink, becoming silvery or whitish on lower sides and belly.



jaws of Etelis

Biology, Habitat and Distribution : A dweller of moderately deep water (about 90 to 450 m), usually over rocky bottoms. These fish occur solitarily or in small groups. The diet consists mainly of small fishes, squids, and crustaceans.

Geographical Distribution : Inshore tropical Indo-West Pacific and western Atlantic Oceans.

Interest to Fisheries : Etelis is an important food fish in many areas, particularly islands of the Indo-West Pacific. They are caught mainly with bottom longlines and deep handlines. The flesh is of good quality and marketed mainly fresh.

Key to the species of Etelis (from Anderson, 1981) :

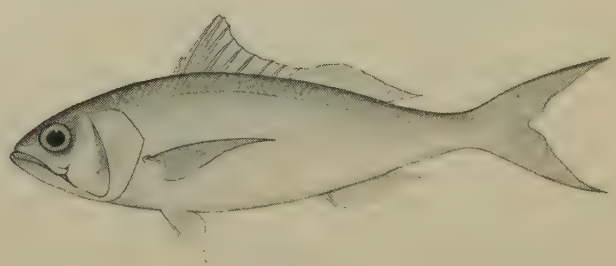
1a. Total gill rakers on first gill arch 17 to 22; gill rakers, excluding rudiments, on first gill arch 10 to 13; upper lobe of caudal fin short, 26 to 30% of standard length in specimens larger than 120 mm standard length. Widespread in the Indo-Pacific ..... **E. carbunculus** (Fig. 1)

1b. Total gill rakers on first gill arch 23 or more; gill rakers, excluding rudiments, on first gill arch 19 or more; upper lobe of caudal fin longer, almost always 32% of standard length or more in specimens larger than 130 mm standard length

E. carbunculus Fig. 1

2a. Total gill rakers on first gill arch 33 to 36; predorsal scales about 17 to 19; caudal peduncle scales 25; tubed lateral line scales 50 to 51; cheek height about 10% of standard length; distance from orbit to angle of preopercle 13 or 14% of standard length. Widespread in the western Pacific/eastern Indian Ocean ..... **E. radiosus** (Fig. 2)

2b. Total gill rakers on first gill arch 23 to 28; predorsal scales 13 to 17; caudal peduncle scales 22 to 24; tubed lateral line scales 47 to 50; cheek height 5 to 8% of standard length; distance from orbit to angle of preopercle 8 to 10% of standard length

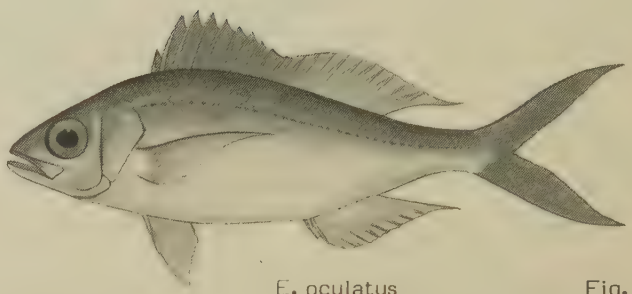


E. radiosus Fig. 2

3a. Length of pelvic fin 21 to 23% of standard length; length of upper lobe of caudal fin 33 to 61% of standard length; length of lower lobe of caudal fin 32 to 41% of standard length. Widespread in the Indo-Pacific ..... **E. coruscans** (Fig. 3)

3b. Length of pelvic fin 18 to 21 of standard length; length of upper lobe of caudal fin 27 to 40% of standard length; length of lower lobe of caudal fin 28 to 34% of standard length. Western Atlantic .. **E. oculatus** (Fig. 4)

E. coruscans Fig. 3



E. oculatus Fig. 4

Etelis carbunculus Cuvier, 1828

LUT Etel 3

Etelis carbunculus Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:127 (Seychelles).

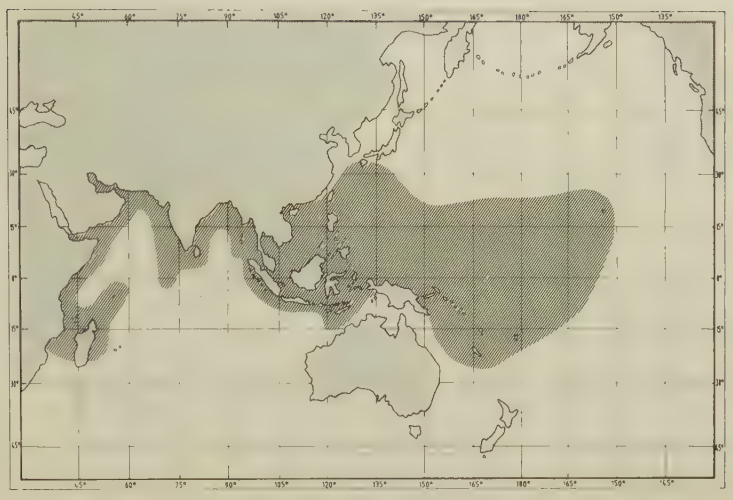
Synonyms : Eteliscus marshi Jenkins (1903).

FAO Names : En - Ruby snapper; Fr - Vivaneau rubis; Sp - Pargo rubí.

See Plate X, 39

Diagnostic Features : Body relatively elongate. Head small, eye large; interorbital space flat; lower jaw slightly projecting; a single row of conical teeth in jaws, usually 1 or 2 pair of enlarged canines anteriorly; maxilla scaled, extending to below middle of eye; vomerine tooth patch narrowly V-shaped; gill rakers on lower limb of first arch (including rudiments) 11 to 14. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins with 15 to 17 rays; dorsal and anal fin bases scaleless; caudal fin forked, the lobes relatively short compared with other Etelis (about 25 to 30% of standard length). Scale rows on back parallel with lateral line. Colour: mainly pink to red, becoming white on lower sides and belly.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from the Hawaiian Islands to East Africa, and from Australia northward to southern Japan.



Habitat and Biology : Inhabits rocky bottoms at depths between about 90 and 300 m Feeds on fishes and larger invertebrates such as squids, shrimps and crabs; also takes planktonic organisms, including pelagic urochordates. At Vanuatu (New Hebrides) spawning occurs throughout most of the year, with peak activity during November. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.07 and 0.08, respectively, for the Vanuatu population (Brouard & Grandperrin, 1984).

Size : Maximum total length of at least 80 cm; common to 50 cm.

Interest to Fisheries : An important food fish in some areas. During recent experimental handline fishing in the Mariana Islands, this fish was the third-most abundant species, constituting 12.5% of the total catch. It is also one of the principal species in the Hawaiian offshore handline fishery (89.5 metric tons and a revenue of US$ 782 000 in 1984. Caught mainly with bottom longlines and deep handlines. Marketed fresh or frozen.

Local Names : GUAM: Ehu; HAWAII: 'Ula'ula; JAPAN: Hachijô-akamutsu; NEW CALEDONIA: Vivaneau rouge; PALAU: Sebus; SAMOA: Palu malau; TAHITI: Paru 'i'ihi.

Literature : Anderson (1981); Masuda et al. (1984).

Remarks : The name E. carbunculus has been wrongly applied to E. coruscans by some previous authors including Fischer & Bianchi (eds) (1984).

Etelis coruscans Valenciennes, 1862

LUT Etel 2

Etelis coruscans Valenciennes, 1862, C.r.hebd.Séanc.Acad.Sci., 54:2 (Ile Bourbon).

Synonyms : Etelis evurus Jordan & Evermann (1903).

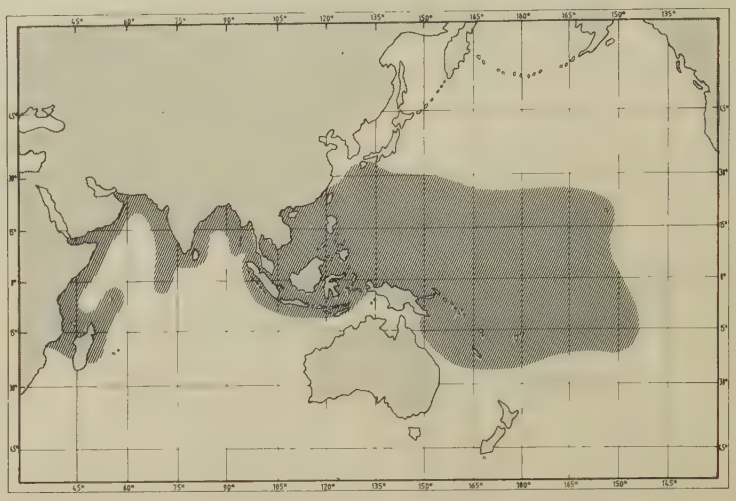
FAO Names : En - Ruby snapper; Fr - Vivaneau laflamme; Sp - Pargo rubi.

See Plate X, 40

Diagnostic Features : Body slender and elongate. Head small, eye large; snout short (shorter than eye diameter); interorbital space flat; lower jaw slightly projecting; maxilla covered with small scales; both jaws with bands of small teeth, those in the outer series better developed and more widely spaced, a few anterior teeth in upper jaw canine-like; vomerine tooth patch narrowly V-shaped; gill rakers on lower limb of first arch (including rudiments) 15 to 18. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays;

pectoral fins with 15 or 16 rays; dorsal and anal fin bases scaleless; caudal fin deeply forked; upper caudal lobe becoming greatly elongate with increased growth. Scale rows on back parallel with lateral line. Colour: back and upper sides deep pink to red; lower sides and belly pink; fins pink to red.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from the Hawaiian Islands to East Africa, and from Australia northward to southern Japan.



Habitat and Biology : Inhabits rocky bottoms at depths between about 100 and 300 m. Feeds on small fishes, squids and crustaceans. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.13 and 0.12, respectively, for the Vanuatu (New Hebrides) population (Brouard & Grandperrin, 1984), and 0.16 and 0.36 respectively, for the Marianas population (Ralston, in press).

Size : Maximum total length to at least 70 cm; common to 40 cm.

Interest to Fisheries : An important foodfish in some areas (for example southern Japan). It is one of the principal species in the Hawaiian offshore handline fishery (19 metric tons and a revenue of US$ 111 700 in 1984). Caught mainly with deep handlines. Marketed fresh or frozen.

Local Names : GUAM: Onaga; HAWAII: Onaga; JAPAN: Hamadai; NEW CALEDONIA: Vivaneau la flamme; SAMOA: Palu-loa; SOUTH AFRICA: Robyn-snapper, Ruby snapper.

Literature : Anderson (1981); Masuda et al. (1984).

Remarks : Closely related to E. oculatus of the western Atlantic Ocean. The two species differ primarily with regard to pelvic and caudal fin lengths (see key to Etelis). The name E. carbunculus has been wrongly applied to E. coruscans by some previous authors including Fischer & Bianchi (eds) (1984).

Etelis oculatus (Valenciennes, 1828)

LUT Etel 1

Serranus oculatus Valenciennes (in C. & V., 1828), His.Nat.Poiss., 2:266 (Martinique).

Synonyms : None

FAO Names : En - Queen snapper; Fr - Vivaneau royal; Sp - Pargo cachucho.

See Plate I, 2

Diagnostic Features : Body elongate and slender. Eye large; snout short (shorter than eye diameter); interorbital space flat; lower jaw slightly projecting; maxilla covered with small scales; both jaws with bands of small teeth, those in the outer series better developed and more widely spaced, a few anterior teeth in upper jaw canine-like; vomerine tooth patch narrowly V-shaped; gill rakers on lower limb of first arch (including rudiments) 16 to 18. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins with 16 or 17 rays; dorsal and anal fin bases scaleless; caudal fin deeply forked. Scale rows on back parallel with lateral line. Colour: back and upper sides deep pink to red; lower sides and belly pale pink; fins pink except spinous portion of dorsal fin; entire caudal fin brilliant red.

Geographical Distribution : Tropical western Atlantic Ocean from Bermuda and North Carolina southward through the Caribbean to Brazil; particularly abundant in the Bahamas and the Antilles. Not reported from the northern Gulf of Mexico.

Habitat and Biology : Inhabits rocky bottoms at depths between about 135 and 450 m. Feeds mainly on small fishes and squids.

Size : Maximum total length about 60 cm; common to 52 cm.

Interest to Fisheries : Although regularly caught in some areas at present, it is mainly of interest as a potential resource. Caught mainly with single and multiple handlines; also taken with bottom longlines. Marketed mostly fresh, sometimes frozen. Flesh of good quality.

Local Names : CUBA: Cachucho, Salmonete de lo alto; PUERTO RICO: Cachucho.

Literature : Jordan & Evermann (1896); Anderson (1967); Fischer (ed.) (1978).

Etelis radiosus Anderson, 1981

LUT Etel 4

Etelis radiosus Anderson, 1981, Copeia, 1981(4):821 (Sri Lanka).

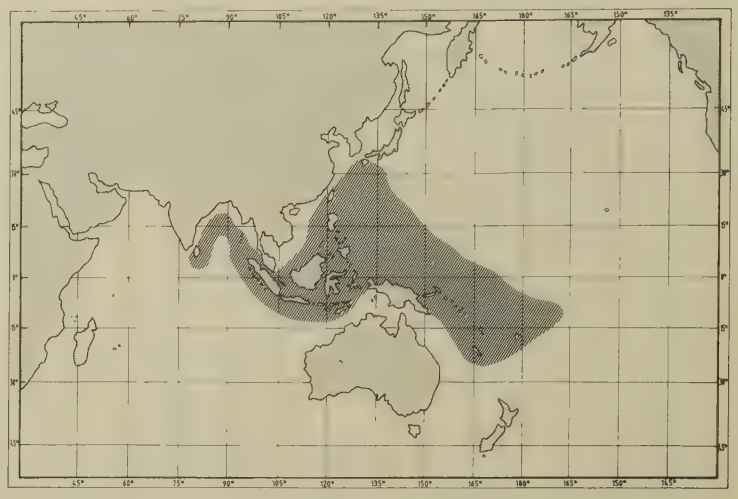
Synonyms : None.

FAO Names : En - Pale snapper; Fr - Vivaneau pâle; Sp - Pargo pálido.

See Plate XI, 41

Diagnostic Features : Body slender and elongate. Head small, eye large; snout short (slightly larger than eye diameter); interorbital space flat; lower jaw projecting; maxilla scaled, extending to below rear half of eye; both jaws with bands of small conical to canine teeth; vomerine tooth patch arch-shaped; gill rakers on lower limb of first arch (including rudiments) 20 or 21. First dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins with 16 rays; dorsal and anal fin bases scaleless; caudal fin forked. Scale rows on back parallel with lateral line. Colour: mainly red, lighter on lower sides and belly.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from Samoa to Sri Lanka, and northward to southern Japan.



Habitat and Biology : Inhabits rocky bottoms at depths between about 90 and 200 m. Feeds mainly on fishes.

Size : Maximum total length about 60 cm; common to 40 cm.

Interest to Fisheries : Potential as an important food fish, but presently caught only in small quantities mainly with deep handlines. Marketed fresh.

Local Names : JAPAN: Okuchi-hamadai.

Literature : Anderson (1981); Masuda et al. (1984).

Hoplopagrus Gill, 1862

LUT Hoplo

Genus : Hoplopagrus Gill, 1862:253. Type-species Hoplopagrus guntheri Gill, 1862, by original designation.

Synonyms : None.

A single species in the genus - see Hoplopagrus guntheri.

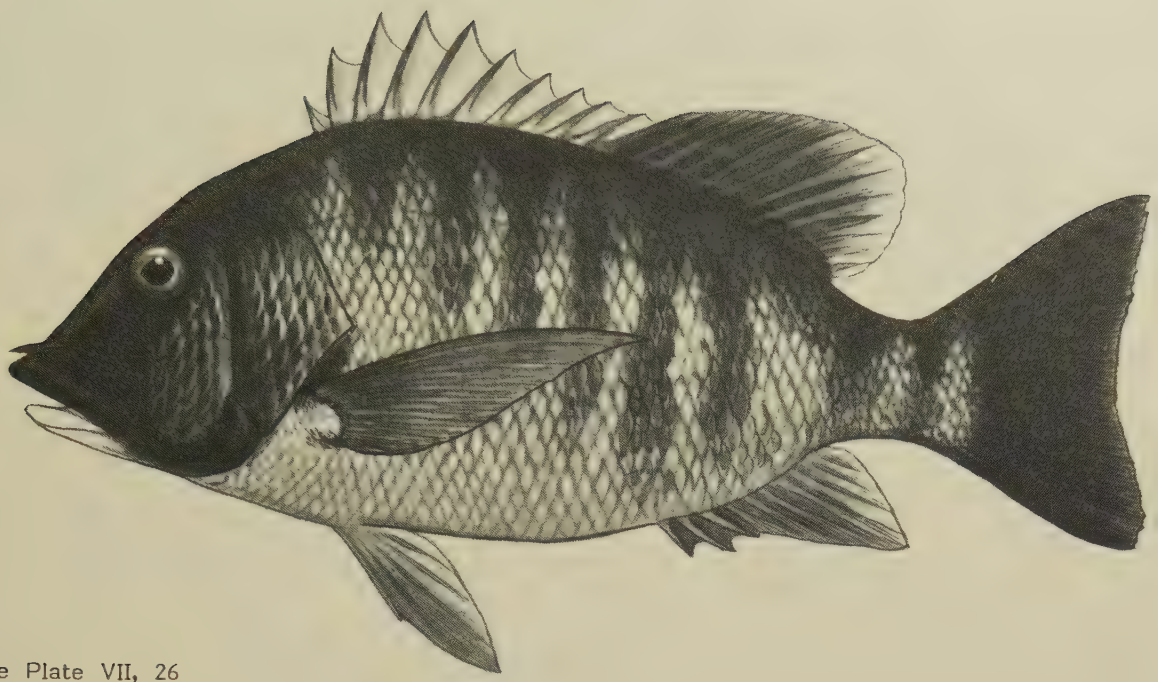
Hoplopagrus guntheri Gill, 1862

LUT Hoplo 1

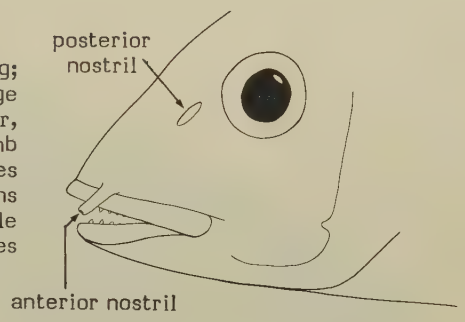
Hoplopagrus guntheri Gill, 1862, Proc.Acad.Nat.Sci.Philadelphia, 1862:253 (Cape San Lucas).

Synonyms : None.

FAO Names : En - Mexican barred snapper; Fr - Vivaneau mexicain; Sp - Pargo coconaco.



See Plate VII, 26



Diagnostic Features : Postopercular notch and knob strong; teeth on lateral part of jaws molar-like; vomer with several large molars; tongue without teeth; anterior nostril long and tubular, posterior nostril in deep groove (see figure); gill rakers on lower limb (including rudiments) of first arch 11 to 15. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 9 soft rays; pectoral fins 16 or 17. Scales medium-sized, about 45 to 49 in lateral line; scale rows on back parallel to lateral line. Colour: greenish with a series of about 8 brown bars on sides; belly pinkish.

Geographical Distribution : Eastern Pacific Ocean from Mexico to Panama.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 50 cm.

Interest to Fisheries : An important species in local subsistance fisheries. It is caught with nets and handlines. Usually marketed fresh.

Local Names : COSTA RICA: Pargo roquero, Pargo rosquero; MEXICO: Coconaco, Pargo, Pargo coconato, Pargo raicero, Pargo rayado, Tecomate; PANAMA: Pargo dientón.

Literature : Jordan & Evermann (1896).

Lipocheilus Anderson, Talwar & Johnson, 1977

LUT Lipo

Genus : Lipocheilus Anderson, Talwar & Johnson, 1977:510. Type-species Tangia carnolabrum Chan, 1970, by original designation.

Synonyms : Genus Tangia Chan, 1970 (preoccupied).

A single species in the genus - see Lipocheilus carnolabrum.

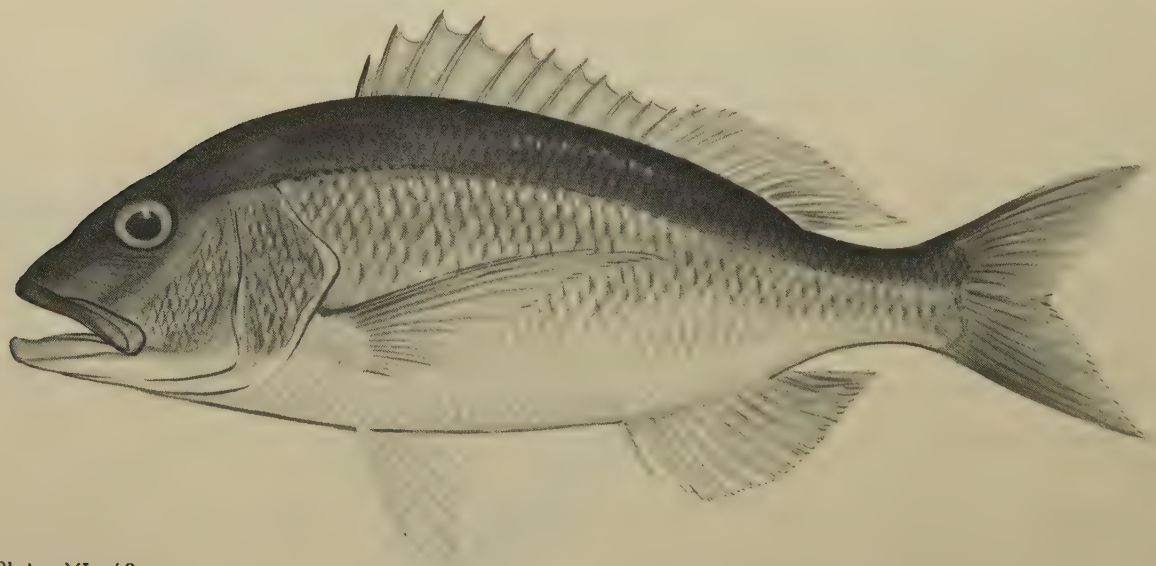
Lipocheilus carnolabrum (Chan, 1970)

LUT Lipo 1

Tangia carnolabrum Chan, 1970, Hong Kong Fish.Bull., 1:22 (about 145 km southeast of Hong Kong).

Synonyms : None.

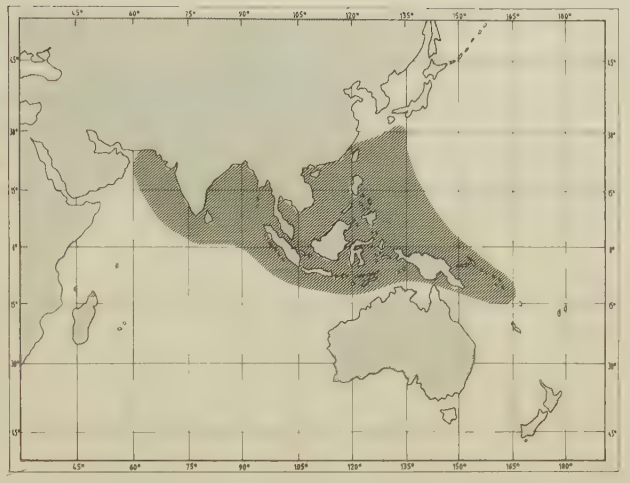
FAO Names : En - Tang's snapper; Fr - Vivaneau verrue; Sp - Pargo trompudo.



See Plate XI, 42

Diagnostic Features : Body moderately deep (38 to 42% of standard length). Mouth large, the upper jaw protruding when mouth is closed; adults with a thick, fleshy protrusion at anterior end of upper lip; maxilla without scales; anterior and posterior nostrils close together and to eye; interorbital space flattened to convex; vomer and palatines with teeth, vomerine tooth patch V-shaped, without a medial posterior extension; no teeth on tongue. Dorsal fin with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; last dorsal and anal soft rays not produced (shorter than penultimate rays); pectoral fins long, reaching beyond level of anus, with 15 or 16 rays; caudal fin moderately forked. Scales moderate-sized, about 48 or 49 in lateral line; scale rows on back parallel to lateral line. Colour: back and upper part of head brown; yellowish or pinkish on sides; a silvery sheen on ventral portion of body.

Geographical Distribution : Widespread in the tropical Indo-Pacific Ocean, but known from relatively few localities including the Ryukyu Islands, South China Sea, Andaman Sea, and the northwestern portion of the Arabian Sea.



Habitat and Biology : Occurs over rocky bottoms of the continental shelf at depths between 90 and 300 m. Probably feeds on fishes and large invertebrates.

Size : Maximum total length about 60 cm; common to 40 cm.

Interest to Fisheries : A moderately common constituent of the longline fishery of the continental shelf off South China. Caught mainly with longlines and handlines; also taken with bottom trawls.

Local Names : JAPAN: Kibire-fuedai.

Literature : Anderson, Talwar & Johnson (1977); Fischer & Bianchi (eds) (1984).

Lutjanus Bloch, 1790

LUT Lut

Genus : Lutjanus Bloch, 1790:108. Type-species Lutjanus lutjanus Bloch, 1790, by absolute tautonymy.

Synonyms : Genus Lutianus Bloch, 1790; Genus Diacope Cuvier, 1815; Genus Mesoprion Cuvier (in C. & V.), 1828; Genus Genyoroge Cantor, 1849; Genus Neomaensis Girard, 1859; Genus Evoplites Gilll, 1862; Genus Hypoplites Gill, 1862; Genus Neomesoprion Castelnau, 1875; Genus Raizero Jordan & Fesler, 1893; Genus Bennettia Fowler, 1904; Genus Parkia Fowler, 1904; Genus Rhomboplitoides Fowler, 1918; Genus Loxolutjanus Fowler, 1931.

Diagnostic Features : Small to large-sized snappers with oblong and relatively deep to slender and fusiform bodies. Mouth relatively large, protractile; pointed, conical teeth in jaws arranged in one or more rows, with an outer series of canine teeth, some of which, particularly those at front of jaws, are generally enlarged and fang-like; vomerine tooth patch V-shaped or crescentic to triangular, with or without a medial posterior extension, or diamond-shaped; interorbital space convex; preopercle serrate, its lower margin with a shallow to deep notch, and opposite portion of interopercle sometimes with a bony knob, most strongly developed in species with a deep preopercular notch. Dorsal fin continuous, often with a slight notch between the spinous and soft portions, with 10 or 11 spines and, 11 to 16 soft rays; anal fin with 3 spines and 7 to 10 soft rays; pectoral fins with 15 to 18 rays; dorsal and anal fins scaled; caudal fin truncate or emarginate, rarely forked. Colour: extremely variable, but often consisting of a reddish, yellow, grey, or brown background and a pattern of darker stripes or bars; frequently with a large blackish spot on upper sides below anterior dorsal soft rays.

Biology, Habitat and Distribution : Lutjanus species are conspicuous inhabitants of coral reef areas and several are commonly taken by trawlers and deep handlining in more offshore waters. Most reef species are encountered in depths less than about 30 to 40 m. Some of the large red snappers penetrate to depths of at least 200 m. The smaller species are frequently seen in large, daytime aggregations close to the surface of the reef. They disperse at night to forage mainly on fishes and crustaceans. Group spawning has been observed in L. kasmira. Males initiate courtship by pecking and rubbing against the body of a female. Eventually other fish join the activities and initiate a spiral ascent, releasing the gametes just below the surface. The tiny (about 0.8 mm diameter), spherical eggs hatch in 18 hours and the newly hatched fry are about 1.8 mm in total length. The grey snapper (L. griseus) of the western Atlantic reaches sexual maturity at an age of about 2 years and is capable of producing more than 5 million eggs per spawning.

Geographical Distribution : Inshore circumtropical and subtropical waters throughout the world.

Interest to Fisheries : The larger species are good eating and are important market fishes throughout the tropics. They are captured by a variety of methods which include handlines, traps, spears, nets and trawling gear. Most species are marketed fresh; sometimes they are frozen or dry-salted.

KEY TO Lutjanus BY REGIONS

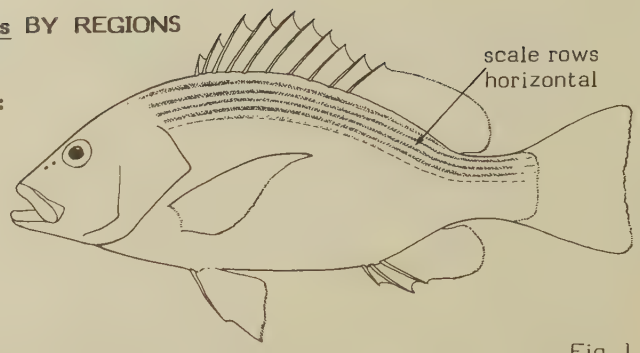


Fig. 1

A. Key to the eastern Pacific species of Lutjanus :

1a. Longitudinal scale rows above lateral line entirely horizontal (Fig. 1)

2a. Vomerine tooth patch roughly diamond-shaped or having a medial posterior extension

3a. Vomerine tooth patch roughly diamond-shaped (Fig. 2a); colour mainly red ..... L. **jordani** (Fig. 3)

3b. Vomerine tooth patch V-shaped or crescentic, sometimes triangular with an elongate posterior extension (Fig. 2b); colour mainly yellow ..... L. **argentiventris** (Fig. 4)

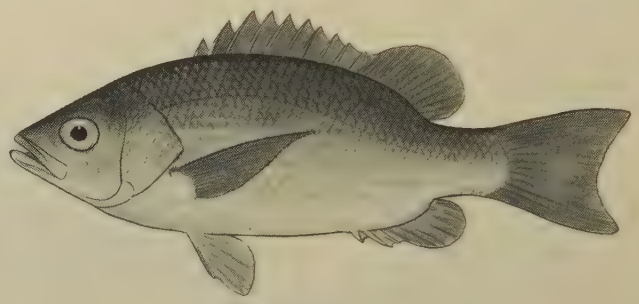
vomerine tooth patches

Fig. 2

2b. Vomerine tooth patch without a medial posterior extension (Fig. 2c)

4a. Dorsal spines 11 or 12; colour dark grey-green to red with alternating dark and light stripes on sides ..... L. **aratus** (Fig. 5)

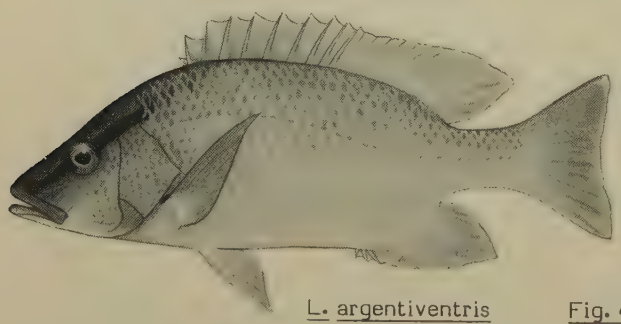
4b. Dorsal spines 10; colour mainly red ..... L. **colorado** (Fig. 6)



L. jordani

Fig. 3

1b. Longitudinal scale rows above lateral line obliquely positioned (Fig. 7)



L. argentiventris

Fig. 4

L. aratus

Fig. 5

L. colorado

Fig. 6

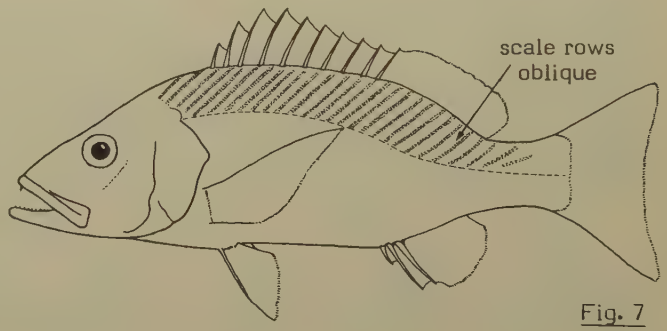


Fig. 7

5a. Body slender, the greatest depth about 3.5 times in standard length; anal soft rays 11 ..... L. **inermis** (Fig. 8)

5b. Body deeper, the greatest depth about 2.5 to 3 times in standard length; anal soft rays 8

6a. Vomerine tooth patch with a medial posterior extension

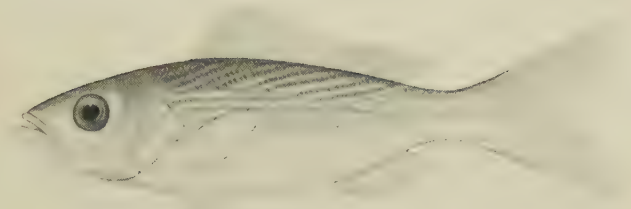
7a. Vomerine tooth patch roughly diamond-shaped (Fig. 9a); gill rakers on lower limb of first arch 12 or 13, but only 7 or 8 distinct, the remainder in form of low rudiments; large adults with grooves from eye to nostrils and at top of preopercle; colour uniformly reddish ..... L. **peru** (Fig. 10)

7b. Vomerine tooth patch triangular with a relatively short backward prolongation (Fig. 9b); gill rakers on lower limb of first arch 12 to 14, all relatilvely distinct; no grooves in front of eye or at top of preopercle; colour red with horizontal rows of blue-grey spots and a large blackish blotch on upper side ..... L. **guttatus** (Fig. 11)

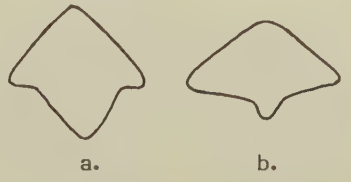
6b. Vomerine tooth patch without a medial posterior extension (Fig. 2c)

8a. Body colour pale (yellow in life) with 5 dark-margined bluish stripes on sides; tongue without teeth ..... L. **viridis** (Fig. 12)

8b. Body colour brown or reddish without stripes; tongue with one or more patches of granular teeth ..... L. **novemfasciatus** (Fig. 13)

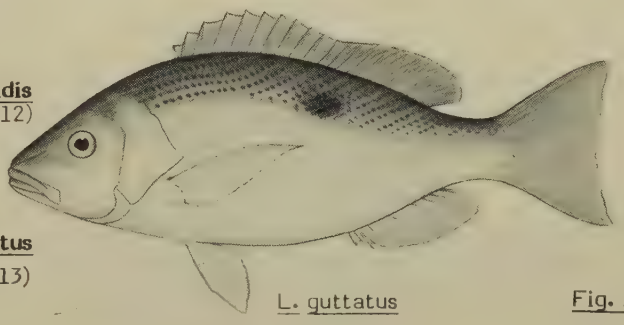


L. inermis Fig. 8



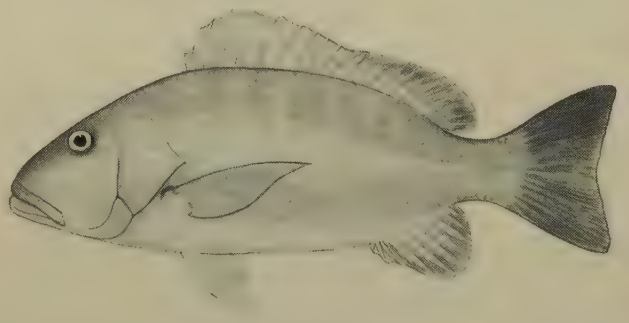
vomerine tooth patches Fig. 9

L. peru Fig. 10



L. guttatus Fig. 11

L. viridis Fig. 12



L. novemfasciatus Fig. 13

B. Key to the Indo-Pacific species of Lutjanus

1a. Preorbital space (distance between upper jaw and eye) very narrow, 9.2 to 16.3 times in head length; body slender, usually 3.0 (sometimes 2.9) or more times in standard length; dorsal spines usually 11, occasionally 10 or rarely 12; soft dorsal rays 12

2a. Body depth 3.5 to 3.8 times in standard length; tongue smooth without teeth; a dark band from snout to caudal fin base and two pearly spots above lateral line, one below spinous portion and the other below soft portion of dorsal fin (central Indian Ocean to Melanesia) ..... **L. biguttatus** (Fig. 1)

L. biguttatus Fig. 1

2b. Body depth 2.9 to 3.3 times in standard length; tongue with a patch of fine granular teeth; colour generally silvery-white with a broad yellow stripe along middle of side to caudal fin base and narrow yellowish lines, corresponding with longitudinal scale rows (eastern Africa to western Pacific) ..... **L. lutjanus** (Fig. 2)

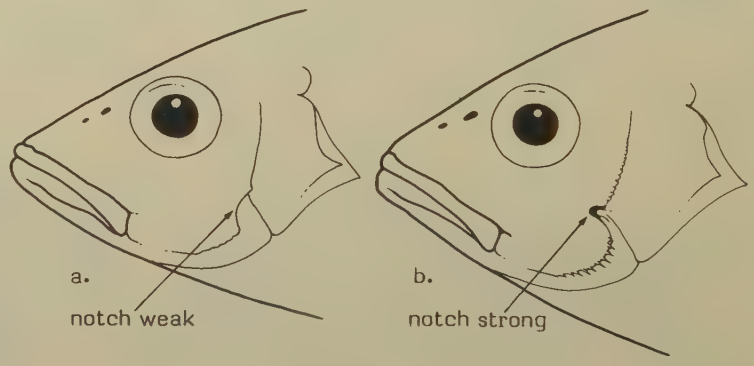
L. lutjanus Fig. 2

1b. Preorbital space wider, 3.3 to 8.9 times in head length; body deeper, 2.1 to 3.1, but usually less than 3.0 times in standard length; dorsal spines variable, 10 to 12; soft dorsal rays occasionally 12, usually 13 or more

3a. Ground colour pale (mainly yellow in life) with a series of 4 to 8 longitudinal stripes (blue in life, often brownish in preservative) on side

4a. Dorsal spines 10

5a. Six to eight stripes on side; a large black spot on upper side below soft part of dorsal fin; usually 12 to 13 soft dorsal rays; preopercular notch weak or absent (Fig. 3a) (southern Red Sea and western Arabian Sea) ... **L. coeruleolineatus** (Fig. 4)



notch on preopercle Fig. 3

5b. Four or five stripes on side; a black spot on upper side below soft part of dorsal fin present or absent; usually 14 or 15, occasionally 13 soft dorsal rays; preopercular notch prominent (Fig. 3b).

L. coeruleolineatus Fig. 4

6a. Four stripes on side, belly more or less abruptly whitish, frequently with thin grey lines; scale rows on cheek 5 or 6; upper pectoral rays darkish (eastern Africa to central Pacific) ..... L. **kasmira** (Fig. 5)

6b Five stripes on side, belly not abruptly whitish and without thin lines; scale rows on cheek 10 or 11; upper pectoral rays pale (central Indian Ocean to western Pacific) ..... L. **quinquelineatus** (Fig. 6)

4b. Dorsal spines 11 or 12

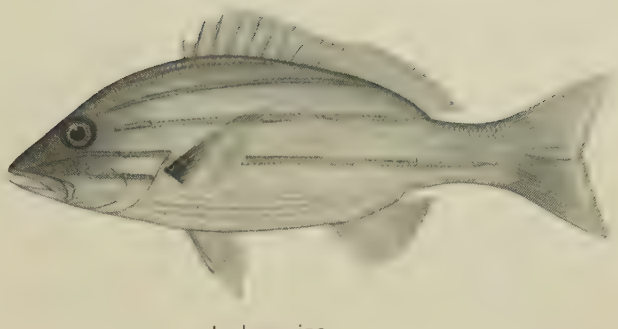
7a. A large black spot usually present on upper side below junction between spiny and soft parts of dorsal fin; three uppermost stripes slanting obliquely toward dorsal fin; gill rakers on lower limb of first gill arch 10 to 13, total rakers 20 (southwestern Indian Ocean) ..... L. **notatus** (Fig. 7)

7b. Black spot absent; uppermost stripes more or less parallel to body axis or only slanting gently toward dorsal profile; gill rakers on lower limb of first gill arch 17 to 19, total rakers 26 to 28 (Indian Ocean and Indo-Malayan Archipelago) .... L. **bengalensis** (Fig. 8)

3b. Colour not as in 3a

8a. Longitudinal scale rows above lateral line obliquely positioned (Fig. 9)

9a. Vomerine tooth patch triangular or diamond-shaped with a medial posterior extension (Fig. 10, columns b, c)



L. kasmira Fig. 5

L. quinquelineatus Fig. 6

L. notatus Fig. 7

L. bengalensis Fig. 8

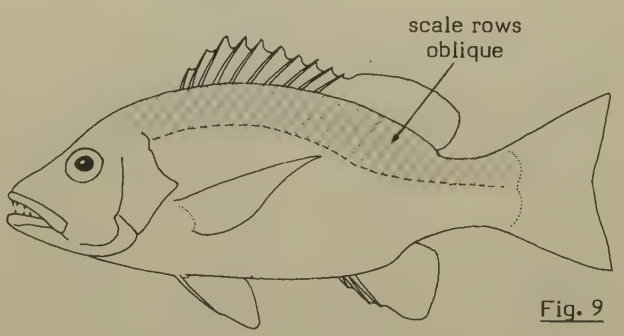
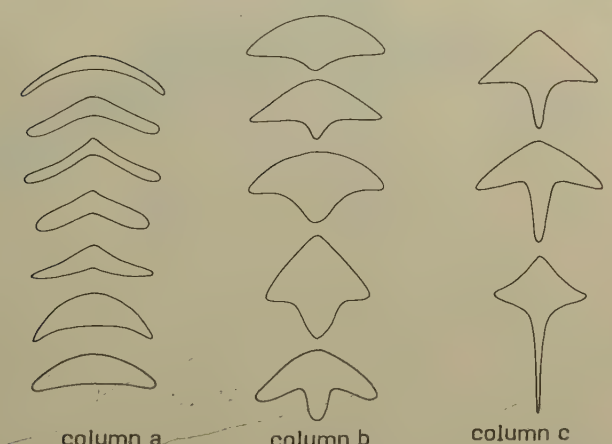
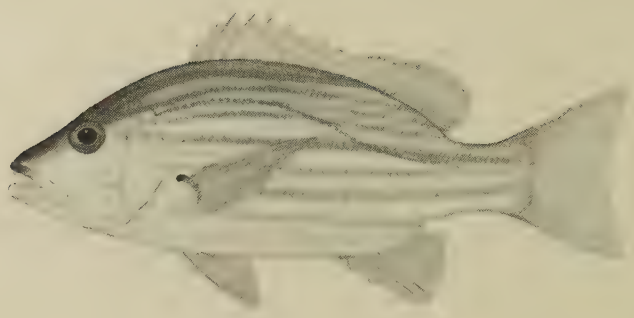


Fig. 9



shapes of vomerine tooth patch Fig. 10

10a. Axil of pectoral fin with a distinct black spot on upper portion; a series of 8 or 9 relatively broad orange or yellow stripes on side; soft dorsal rays usually 15 (occasionally 14, rarely 16); soft anal rays 9 (India to Melanesia and Australia) ..... L. **carponotatus** (Fig. 11)

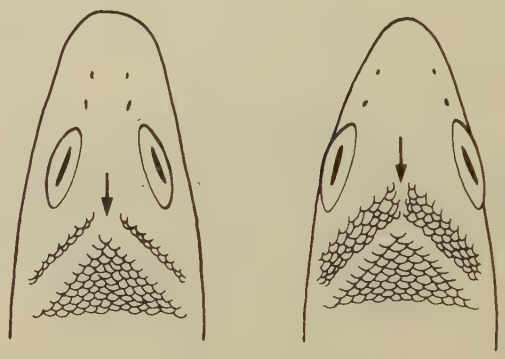


L. carponotatus Fig. 11

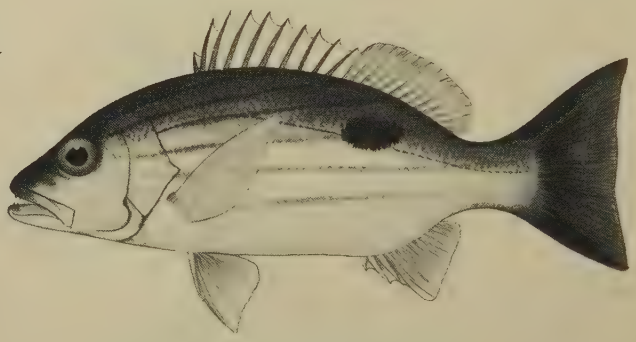
10b. Axil of pectoral fin without a black spot; colour not as in 7a; soft dorsal rays usually 13 or 14 (rarely 12); soft anal rays usually 8 (rarely 9)

11a. A large black spot usually present on upper side, juveniles sometimes with an ocellated spot and/or a series of 4 to 7 broad dark stripes on side

12a. Soft dorsal rays usually 14; a relatively wide gap between temporal scale bands of each side (Fig. 12a); spot on upper side situated mainly above lateral line; young specimens with series of 4 to 7 broad stripes (blackish to orange or yellow-brown in life) on side, these persisting as thin stripes in adults from the western Indian Ocean (eastern Africa to western Pacific) ..... L. **russelli** (Fig. 13)



a. top of head b. Fig. 12



L. russelli Fig. 13

12b. Soft dorsal rays usually 13; little or no gap between temporal scale bands of each side (Fig. 12b); spot on upper side situated mostly below lateral line or bisected by it, spot sometimes very elongated; young specimens without series of 4 to 7 broad dark stripes on side (eastern Africa to central-south Pacific) ..... L. **fulviflamma** (Fig. 14)

11b. Black spot absent; a series of narrow, yellowish longitudinal lines on side, those on upper back slanting upward toward dorsal fin base, sometimes an enlarged darker stripe from eye to middle of caudal fin base

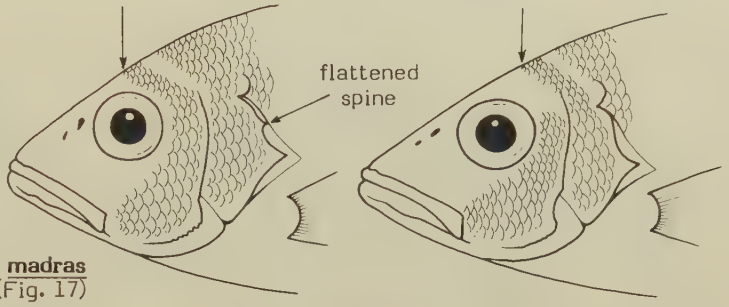
L. fulviflamma Fig. 14

13a. Mid-lateral stripe usually broader and darker than other stripes on side; transverse scale rows on cheek 7 to 10 (western Indian Ocean to western Pacific) ..... **L. vitta** (Fig. 15)

13b. Mid-lateral stripe not broader or darker than other stripes on side, yellow in life and faint or absent in preserved specimens; transverse scale rows on cheek usually 6 or 7, occasionally 8

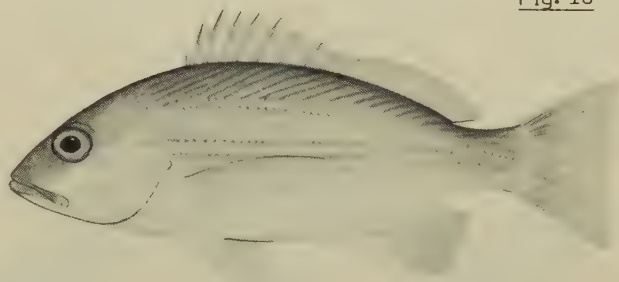
L. vitta Fig. 15

14a. Predorsal scales extending to mid-interorbital level; a blunt, flattened spine on upper margin of opercle, above the main centrally located spine (Fig. 16a); interorbital width 4.4 to 6.5 in head length; total gill rakers on first arch 18 to 21 (eastern Africa to Indonesia and the Philippines) ..... **L. madras** (Fig. 17)



a. b. Fig. 16

14b. Predorsal scales extending to level of rear part of orbit; blunt spine above central opercle spine absent (Fig. 16b); interorbital width 6.5 to 6.9 in head length; total gill rakers on first arch 15 or 16 (Indonesia to Samoa) ..... **L. mizenkoi** (Fig. 18)



L. madras Fig. 17

9b. Vomerine tooth patch crescentic to triangular without a posterior extension (Fig. 10, column a)

15a. Total gill rakers on first arch 25 to 30

16a. Dorsal fin with 10 spines and 14 soft rays; longitudinal scale rows below lateral line parallel to axis of body (Fig. 19); caudal fin emarginate; colour generally pale with a golden-brown mid-lateral stripe, slightly narrower than eye, and a series of oblique golden-brown lines ascending from lateral line to base of dorsal fin (eastern Australia and New Caledonia) ..... **L. adetii** (Fig. 20)

L. mizenkoi Fig. 18

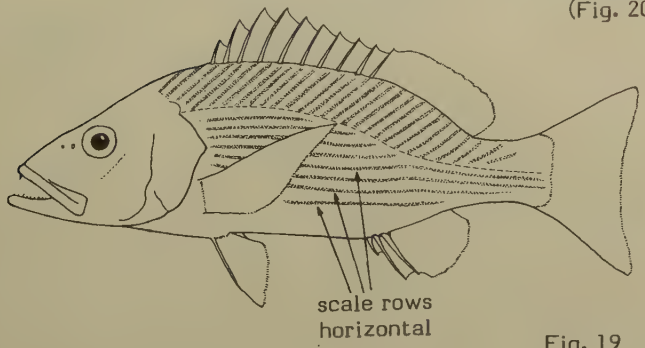
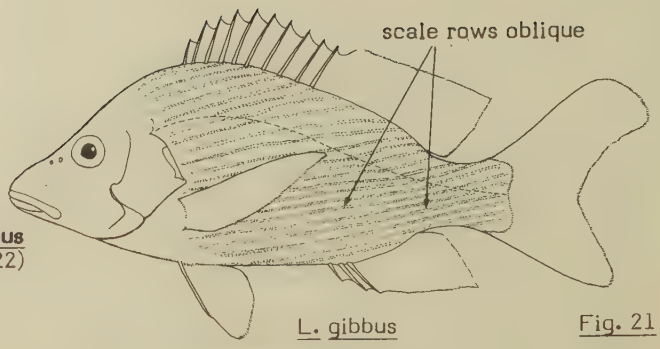


Fig. 19

L. adetii Fig. 20

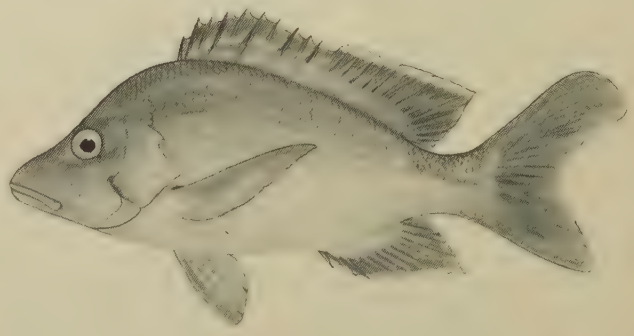
16b. Dorsal fin with 10 spines and 13 or 14 soft rays; scale rows below lateral line ascending obliquely (Fig. 21); caudal fin distinctly forked with rounded lobes; colour deep red to grey, fins red or dark brown to blackish (eastern Africa to central-west Pacific) ..... **L. gibbus** (Fig. 22)



L. gibbus Fig. 21

15b. Total gill rakers on first arch 14 to 23

17a. Soft anal rays 10; dorsal fin with 11 spines and 16 rays (rarely 15); colour pattern consisting of three dark brown to red transverse bars, although they may be indistinct in large adults (eastern Africa to western Pacific) ..... **L. sebae** (Fig. 23)

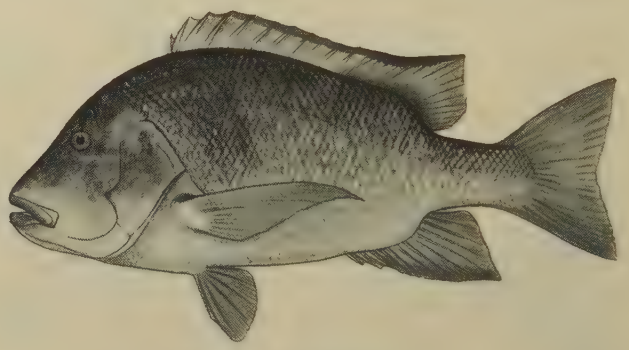


L. gibbus Fig. 22

17b. Soft anal rays 8 or 9; dorsal fin elements variable, 10 or 11 spines, 12 to 16 soft rays; colour not as in 17a

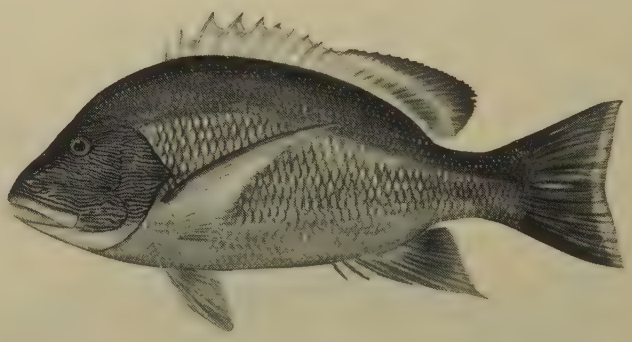
18a. Preopercular notch distinctive (moderately to well developed, (Fig. 3b)

19a. Soft dorsal rays 15 or 16; body relatively deep, 2.1 to 2.4 times in standard length; head usually with numerous wavy lines (bluish in life); a chalky spot often present on lateral line below junction of spinous and soft parts of dorsal fin, bordered with black in juveniles, but lost with age; lips thick in large adults (eastern Africa to central-south Pacific) ..... **L. rivulatus** (Fig. 24)



L. sebae Fig. 23

19b. Soft dorsal rays 13 or 14; body usually more slender, 2.3 to 2.8 times in standard length; colour not as in 19a; lips not thick in adults



L. rivulatus Fig. 24

20a. Caudal fin and distal third of dorsal fin blackish or dusky brown with a narrow white border (eastern Africa to central-west Pacific) ..... **L. fulvus** (Fig. 25)

20b. Caudal fin yellow or grey basally and yellow distally (tan to medium brown in preservative) without narrow white border; distal third of dorsal fin not noticeably darker than remainder of fin

21a. A small (much less than pupil size) chalk-white spot on back just above lateral line at level of anterior part of soft dorsal fin; colour generally brown to purplish; body depth 2.4 to 2.5 times in standard length; snout 2.6 and preorbital 4.1 to 5.2 times, both in head length; total gill rakers on first arch 16 to 19; dorsal spines 10 (northwestern Pacific, Hong Kong to southern Japan) ..... **L. stellatus** (Fig. 26)

21b. No white spot on back, often a large brownish spot in this position, but usually faint or absent in fresh dead or preserved specimens; colour generally pink or reddish with faint yellow stripes (absent in preservative) on side, margin of dorsal fin sometimes blackish; snout 2.8 to 3.2, preorbital 5.3 to 6.6 times, both in head length; total gill rakers on first arch 20 to 23; dorsal spines 10 or 11 (eastern Indian Ocean to central-south Pacific) ..... **L. boutton** (Fig. 27)

18b. Preopercular notch indistinct (shallow or absent, Fig. 3a)

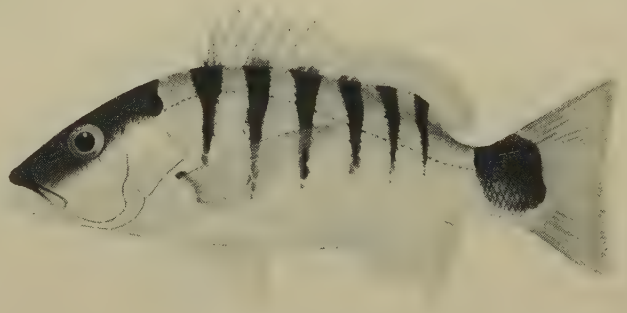
22a. Eight broad transverse bands or saddles on upper half of body and a large black blotch in centre of caudal peduncle (Indonesia to central-south Pacific) ..... **L. semicinctus** (Fig. 28)

22b. Colour pattern not as in 22a

L. fulvus Fig. 25

L. stellatus Fig. 26

L. boutton Fig. 27



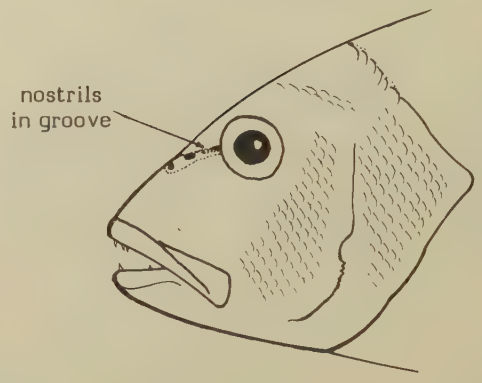
L. semicinctus Fig. 28

23a. Colour pattern consisting of a series of 5 dark stripes on whitish ground colour; 2 or 3 uppermost stripes crossed by dark vertical bars forming a network of light and dark squares; a large dark spot at base of caudal fin (central Indian Ocean to western Pacific) ..... **L. decussatus** (Fig. 29)

23b. Colour pattern not as in 23a

L. decussatus Fig. 29

24a. Nostrils set in a prominent groove running forward from eye in specimens exceeding about 20 cm standard length (Fig. 30); specimens under this size frequently with 2 whitish spots on upper back, anterior spot below last four dorsal spines and posterior one under last six dorsal rays and meeting that of other side across top of caudal peduncle; colour generally dark brown on upper back grading to tan or light brownish (white or pink in life) ventrally; dorsal and caudal fins dusky; outer portion of anal and pelvic fins distinctly blackish; upper third of pectoral fin dusky brown; tongue with a patch of fine granular teeth (eastern Africa to central Pacific) ..... **L. bohar** (Fig. 31)



L. bohar Fig. 30

24b. Nostrils not set in a groove at all sizes; colour pattern not as in 24a; tongue smooth or with a patch of granular teeth

L. bohar Fig. 31

25a. Caudal fin with a distinctive crescentic black marking, remainder of body and fins uniformly yellowish-tan (yellow in life) with a silvery sheen on lower sides (central Indian Ocean to Melanesia) ..... **L. lunulatus** (Fig. 32)

25b. Caudal fin without a distinctive black marking (although a dark smudge or blotch present on middle caudal rays of L. bitaeniatus under about 20 cm standard length); colour of body and fins variable

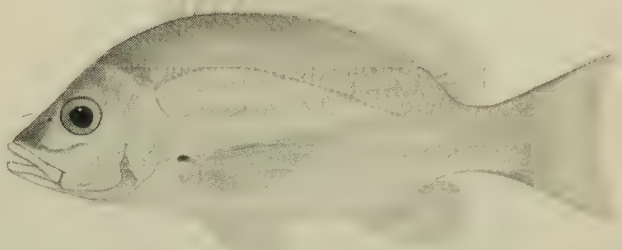
L. lunulatus Fig. 32

26a. A black spot on upper side at level of lateral line below soft dorsal fin (faint or occasionally absent in large adults); remainder of body and fins mainly pale (fins yellow, body pink or yellow in life); tongue with a patch of fine granular teeth, although sometimes absent in juveniles (eastern Africa to central Pacific) ..... L. **monostigma** (Fig. 33)

L. monostigma Fig. 33

26b. Black spot on upper side of body absent, although a saddle or spot sometimes present on upper portion of caudal peduncle; tongue smooth

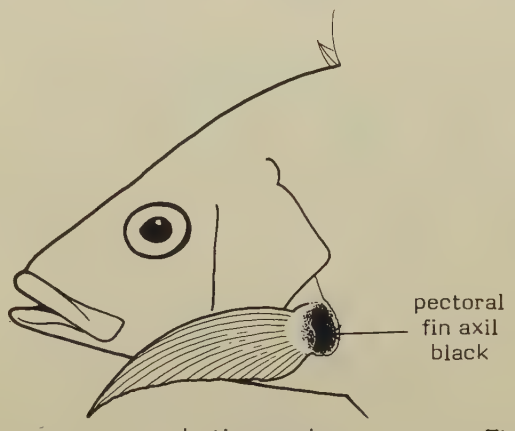
27a. Dorsal spines 12; a series of 5 or 6 dusky stripes (yellow in life, may be faint in preservative); longitudinal rows of scales below lateral line rising obliquely (Indonesia and the Philippines) ..... L. **dodecacanthoides** (Fig. 34)



L. dodecanthoides Fig. 34

27b. Dorsal spines 10 or 11; colour not as in 27a; longitudinal rows of scales below lateral line parallel to axis of body or rising obliquely

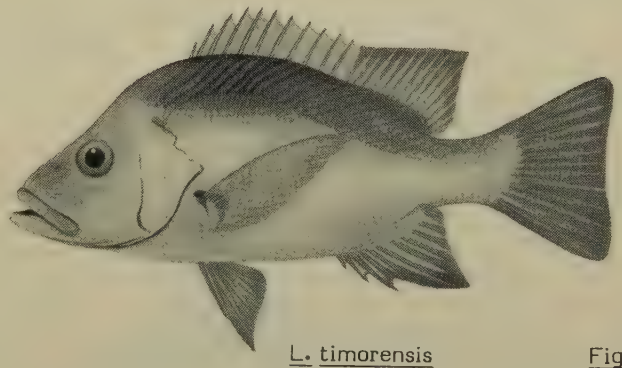
28a. Axil of pectoral fin black (Fig. 35); colour overall deep red in life; posterior dorsal and anal fin rays elongated to form pointed fins; soft anal rays 8 (eastern Indian Ocean to western Pacific) .....L. **timorensis** (Fig. 36)



L. timorensis Fig. 35

28b. Axil of pectoral fin without black marking; colour variable, although often red in life; posterior dorsal and anal rays low and rounded or tall and pointed, but specimens having latter condition usually with nine soft anal rays

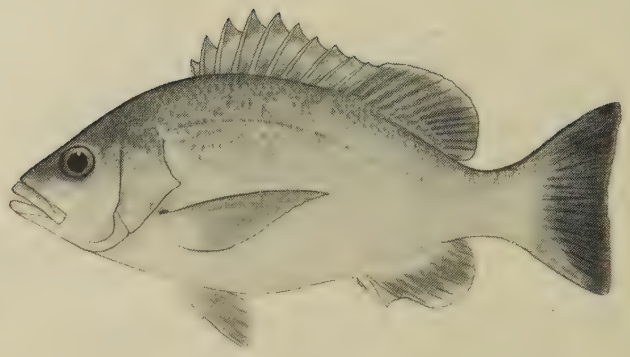
29a. Dorsal spines 10; soft anal rays usually 8, rarely 9; tongue with a patch of fine, granular teeth; colour variable, pink to grey-brown (tan to brown in preservative); juveniles without black saddle on upper caudal peduncle



L. timorensis Fig. 36

30a. Interorbital width 4.9 to 5.2 times in head length; body relatively deep, the depth 2.3 to 2.5 times in standard length; snout-forehead profile straight or convex; colour generally red or pink (brown to yellowish in preservative), fins pale except in juveniles which may have a crescentic blotch in middle of caudal fin (eastern Indian Ocean and Indonesia) ..... L. **bitaeniatus** (Fig. 37)

30b. Interorbital width 5.5 to 7.6 times in head length; body generally more slender, the depth 2.5 to 2.8 times in standard length; snout-forehead profile concave in specimens over about 150 to 200 mm standard length; colour generally grey-brown, reddish or pink ventrally, dorsal and caudal fins dusky brown or black, frequently with a narrow white border posteriorly; juveniles with a broad, black, mid-lateral stripe (eastern Africa to western Pacific) ..... L. **lemniscatus** (Fig. 38)

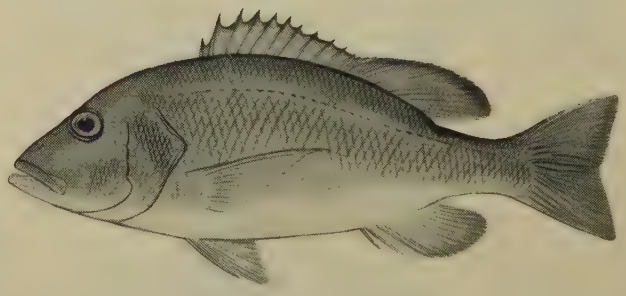


L. bitaeniatus Fig. 37

L. lemniscatus Fig. 38

29b. Dorsal spines usually 11, rarely 10; soft anal rays usually 9, occasionally 8; tongue smooth; colour largely reddish (brown in preservative); juveniles usually with a black saddle on upper caudal peduncle

31a. Dorsal profile of head concave; longitudinal scale rows below lateral line horizontal (as in Fig. 19); hump on forehead absent; interorbital width relatively narrow, about 5.8 to 6.0 times in head length; length of maxilla significantly less than distance between bases of last dorsal and anal rays (as in Fig. 42a); pectoral fins yellow in life (central and western Indian Ocean) ..... L. **guilcheri** (Fig. 39)



L. guilcheri Fig. 39

31b. Dorsal profile of head straight, concave or convex; longitudinal scale rows below lateral line horizontal or oblique; hump on forehead present or absent; interorbital width variable, 3.5 to 6.6 times in head length; length of maxilla variable, about equal to or significantly less than distance between bases of last dorsal and anal rays; pectoral fins reddish or pink in life

32a. A prominent hump on forehead and a series of shallow, horizontal grooves behind eye in specimens over about 20 to 25 cm standard length; anterior and posterior nostrils widely separated, the distance between them much greater than length of posterior nostril opening (Fig. 40a) (Red Sea and western Indian Ocean) ..... L. **sanguineus** (Fig. 41)

32b. Hump on forehead and grooves behind eye absent at all sizes; anterior and posterior nostrils close-set, the distance between them about equal or less than length of posterior nostril opening (Fig. 40b)

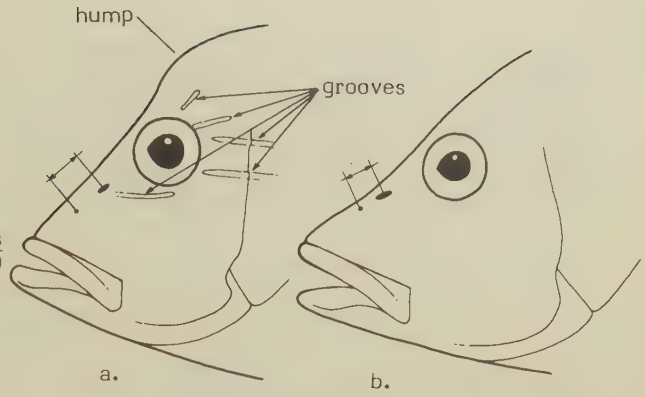
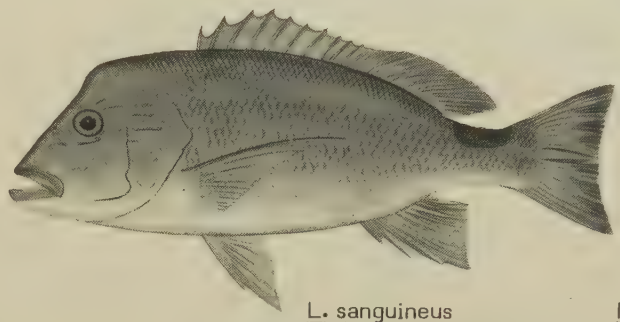


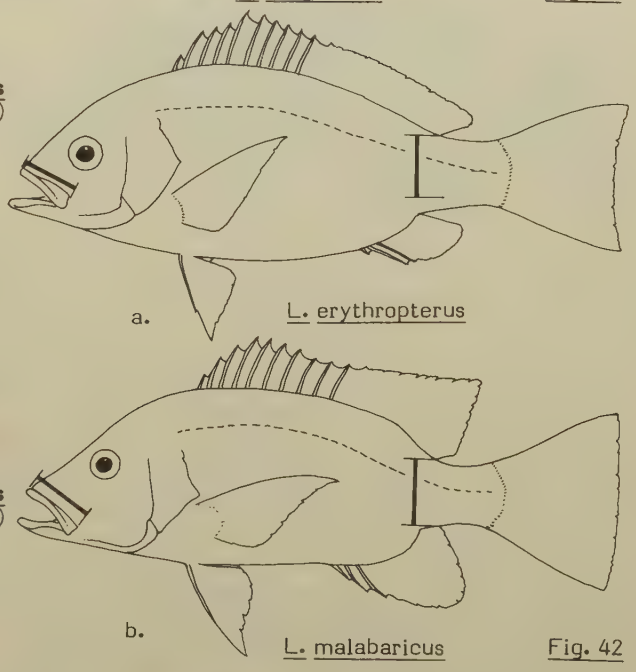
Fig. 40

33a. Mouth relatively small, maxilla length much less than distance between bases of last dorsal and anal rays (Fig. 42a); interorbital width 3.5 to 4.8 times in head length (specimens in excess of 15 cm standard length); some longitudinal scale rows below lateral line slanting obliquely in posterior direction toward dorsal profile (as in Fig. 21); head profile convex (in specimens over about 15 cm standard length) (northwestern Indian Ocean to western Pacific) ..... L. **erythropterus** (Fig. 43)



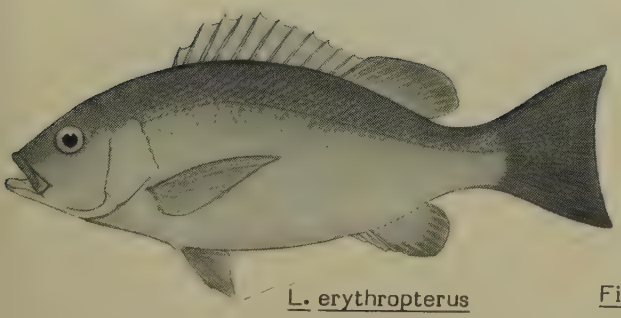
L. sanguineus Fig. 41

33b. Mouth larger, maxilla length about equal to distance between bases of last dorsal and anal rays (Fig. 42b); interorbital width 5.1 to 6.6 times in head length (specimens in excess of 12 cm standard length); longitudinal scale rows below lateral line horizontal (as in Fig. 19), although some rows may slant obliquely in juveniles under about 10 cm standard length); head profile straight or slightly concave (eastern Africa to western Pacific) ..... L. **malabaricus** (Fig. 44)



L. erythropterus

L. malabaricus Fig. 42



L. erythropterus Fig. 43

L. malabaricus Fig. 44

8b. Longitudinal scale rows above lateral line entirely horizontal (Fig. 45a) or some rows rising obliquely from below middle part of dorsal fin (Fig. 45b)

34a. Colour pattern consisting of four, relatively wide dusky brown or blackish stripes on pale ground; only juveniles to 11 cm standard length known (freshwater streams of the Philippines, Indonesia, and New Guinea) ..... L. **maxweberi** (Fig. 46)

34b. Colour pattern not as in 34a

35a. Vomerine tooth patch triangular with a medial posterior extension (Fig. 10, columns b, c); preorbital space narrow, 8.6 to 10.3 times in head length; a prominent black spot, larger than eye, bisected by the lateral line below posterior part of spinous dorsal fin (eastern Africa to western Pacific) ..... L. **ehrenbergii** (Fig. 47)

35b. Vomerine tooth patch crescentic to triangular without a medial posterior extension (Fig. 10, column a); preorbital space wider, 4.7 to 4.9 times in head length; black spot on back present or absent

36a. A large black spot on upper back usually present, if absent ground colour pale

37a. Ground colour pale, each scale on side often with a brownish spot forming longitudinal rows on side; large spot on back, if present, situated mainly above lateral line; interorbital width 5.6 to 7.3 times in head length; preorbital space 4.9 to 6.0 times in head length; tongue with a patch of fine granular teeth (eastern Africa to central-south Pacific) ..... L. **johnii** (Fig. 48)

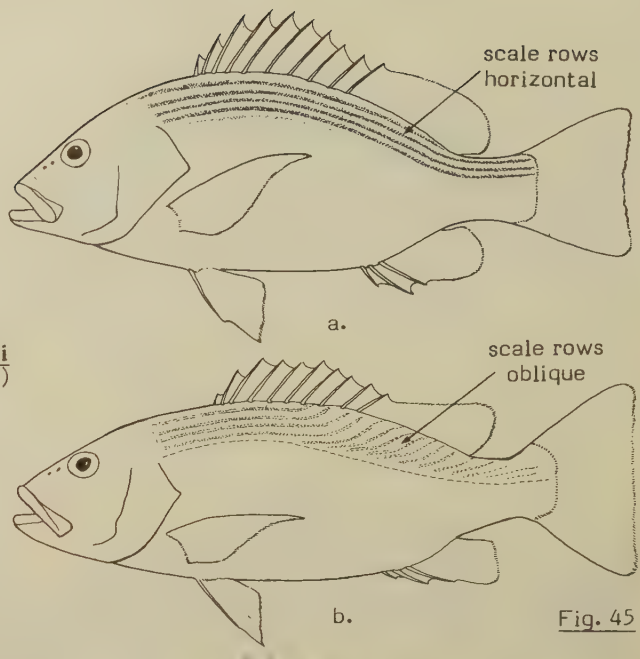
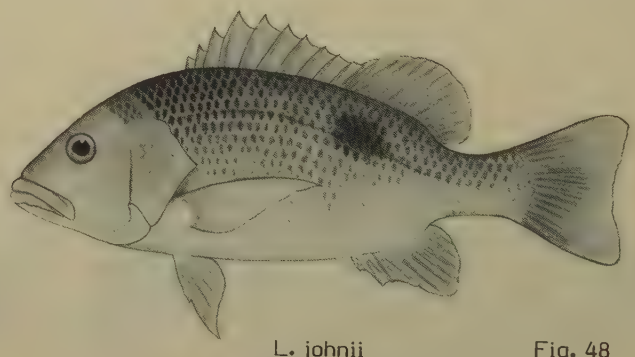


Fig. 45

L. maxweberi Fig. 46

L. ehrenbergii Fig. 47



L. johnii Fig. 48

37b. Ground colour dusky brown; large spot on back bisected equally by the lateral line; interorbital width 5.0 to 5.6 times in head length; preorbital space about 6.8 times in head length; tongue smooth (freshwaters of China, the Philippines, Indonesia, and New Guinea) ..... **L. fuscescens** (Fig. 49)

L. fuscescens Fig. 49

36b. Black spot on upper back absent, ground colour dark

38a. Body depth 2.5 to 2.9 (average about 2.7) times in standard length; least depth of caudal peduncle 3.0 to 3.5 times in head length; longitudinal scale rows on upper back parallel to lateral line anteriorly and some rows usually ascending obliquely below posterior dorsal spines (Fig. 45b); a marine species also dwelling in brackish estuaries and lower reaches of freshwater streams (eastern Africa to central Pacific) ..... **L. argentimaculatus** (Fig. 50)

L. argentimaculatus Fig. 50

38b. Body depth 2.2 to 2.6 times in standard length; least depth of caudal peduncle 2.5 to 3.0 times in head length; longitudinal scale rows on upper back entirely parallel to lateral line (Fig. 45a); a freshwater species (Southern New Guinea) ..... **L. goldiei** (Fig. 51)

L. goldiei Fig. 51

C. Key to the eastern Atlantic species of Lutjanus

1a. Longitudinal scale rows above lateral line rising obliquely (Fig. 1); vomerine tooth patch without a narrow elongate posterior extension, but usually crescentic to triangular in shape, often with a short, medial posterior extension (Fig. 2)

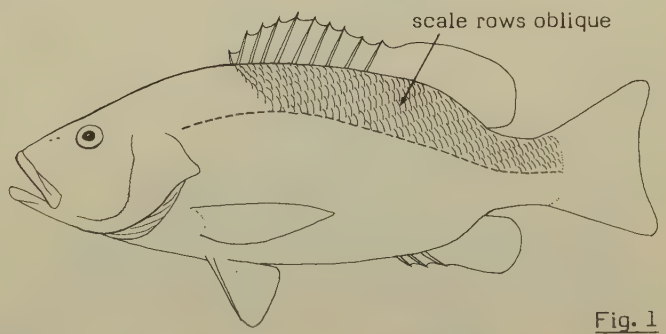
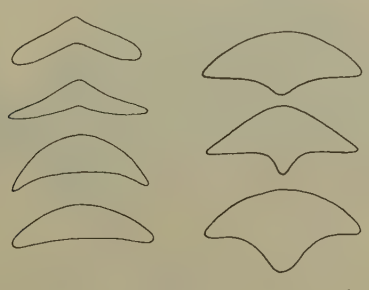
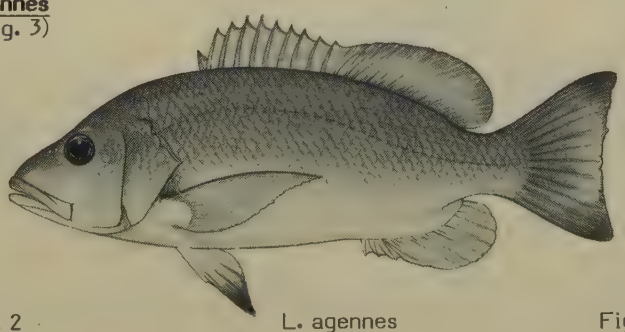


Fig. 1

2a. Transverse scale rows on cheek 5 or 6; forehead profile distinctly angular; juveniles with narrow pale bars (or vertical rows of spots), narrower than dark interspaces on sides ..... **L. agennes** (Fig. 3)



shapes of vomerine tooth patch Fig. 2

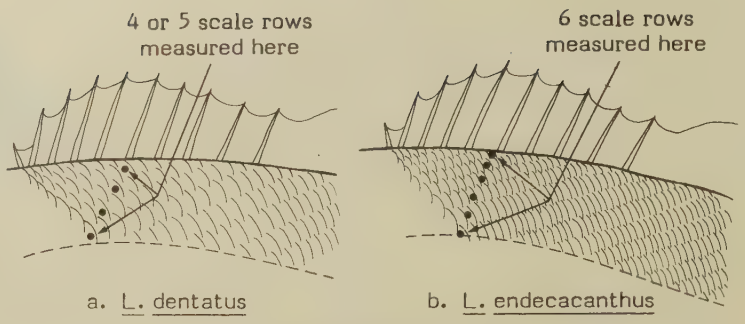


L. agennes Fig. 3

2b. Transverse scale rows on cheek 8 to 10; forehead profile variable, rounded to angular; juveniles with either 6 to 8 vertical rows of spots on sides or with alternating light and dark bars of about equal width

3a. Longitudinal scale rows above lateral line (below middle of spinous dorsal fin) 4 or 5 (Fig. 4a); forehead profile evenly curved; juveniles with alternating light and dark bars of approximately the same width ..... **L. dentatus** (Fig. 5)

3b. Longitudinal scale rows above lateral line (below middle of spinous dorsal fin) 6 (Fig. 4b); forehead profile angular; juveniles often with 6 to 8 vertical rows of white spots on sides ..... **L. endecacanthus** (Fig. 6)



a. L. dentatus b. L. endecacanthus

scale rows above lateral line under spinous part of dorsal fin Fig. 4

L. dentatus Fig. 5

L. endecacanthus Fig. 6

1b. Longitudinal scale rows above lateral line entirely horizontal (Fig. 7); vomerine tooth patch with a narrow elongate posterior extension (Fig. 8)

4a. Total gill rakers (excluding rudiments) on first arch 7 or 8; a blue stripe from snout to edge of opercle ..... **L. goreensis** (Fig. 9)

4b. Total gill rakers (excluding rudiments) on first arch 16; no blue stripe from snout to edge of opercle ..... **L. fulgens** (Fig. 10)

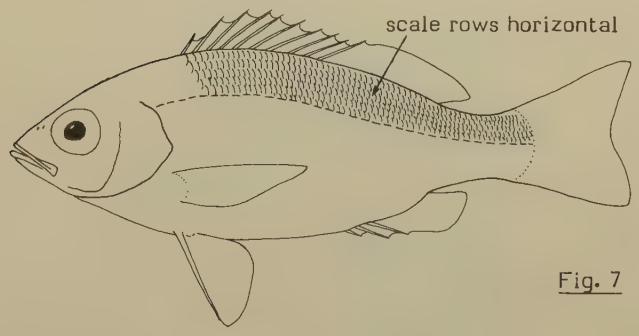
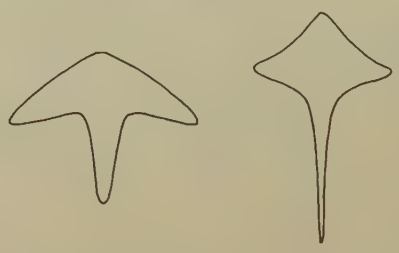
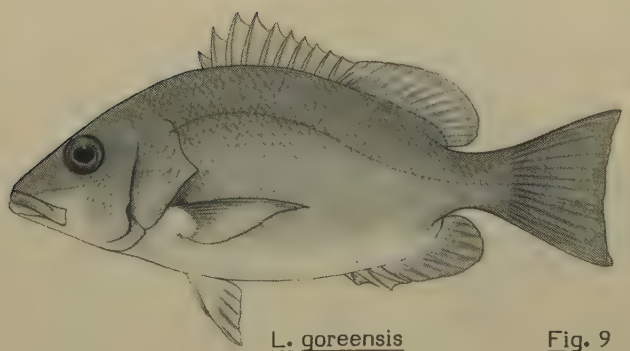


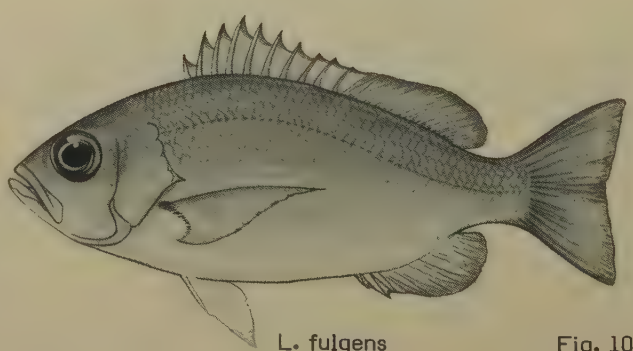
Fig. 7



shapes of vomerine tooth patches Fig. 8



L. goreensis Fig. 9



L. fulgens Fig. 10

D. Key to the western Atlantic species of Lutjanus (modified from Anderson, 1967 and Rivas, 1966)

1a. Dorsal fin with 10 spines and usually 12 soft rays (rarely 11 or 13 soft rays); a black spot below anterior soft dorsal rays, persisting throughout life

2a. About 1/4 to 1/2 of black lateral spot extending below lateral line; gill rakers 7 or 8 + 15 to 17 including rudiments ..... **L. mahogoni** (Fig. 1)

2b. Less than 1/4 or none of black lateral spot extending below lateral line in specimens larger than about 6 cm standard length; gill rakers 6 or 7 + 13 or 14 (rarely 11 or 15) including rudiments ..... **L. synagris** (Fig. 2)

1b. Dorsal fin with usually 10 spines and 14 soft rays (rarely 9 or 11 spines and 13 or 15 soft rays); black spot below anterior soft dorsal rays present or absent

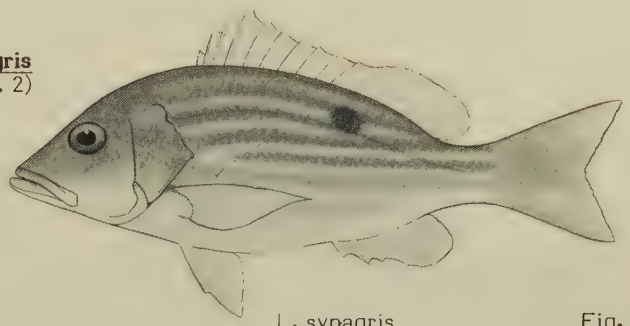
3a. A large, pronounced black spot at base and in axil of pectoral fin; no black spot below anterior rays of soft part of dorsal fin; anal fin rounded; a dark area on scales at base of soft part of dorsal fin (not always obvious on preserved specimens) ..... **L. buccanella** (Fig. 3)

3b. No large, pronounced black spot at base and in axil of pectoral fin; black spot below anterior rays of soft part of dorsal fin present or absent; anal fin rounded or angulated; dark area at base of soft part of dorsal fin absent

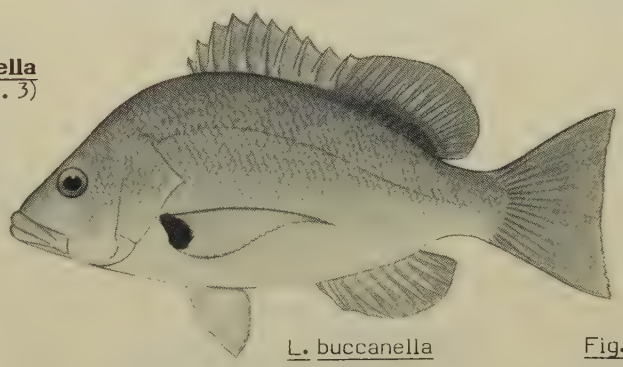
4a. Anal fin rounded at all sizes, the middle rays considerably less than half the length of head; no black spot below anterior rays of soft part of dorsal fin

5a. Vomerine tooth patch without a distinct medial posterior extension (Fig. 5, column a); upper and lower canines very strong, about equally developed; cheek scales in 8 to 10, usually 9 rows ..... **L. cyanopterus** (Fig. 4)

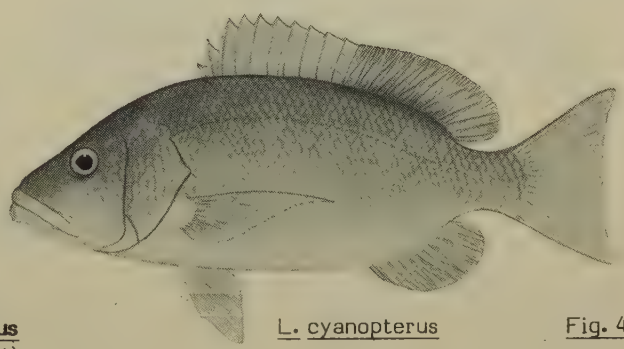
L. mahogoni Fig. 1



L. synagris Fig. 2



L. buccanella Fig. 3



L. cyanopterus Fig. 4

5b. Vomerine tooth patch triangular or anchor-shaped, with a medial posterior extension (Fig. 5, columns b, c); upper canines usually larger than lower; cheek scales in 5 to 9, usually 7 or 8 rows

6a. Body relatively slender (depth about 3.0 times in standard length; anal soft rays 9; gill rakers on lower limb (including rudiments) 16 to 18 ..... L. **ambiguus** (Fig. 6)

6b. Body deeper, 2.3 to 2.8 times in standard length except 2.6 to 3.2 times in L. griseus; anal soft rays 7 to 9; gill rakers on lower limb (including rudiments) 11 to 17 (11 to 16 in most species)

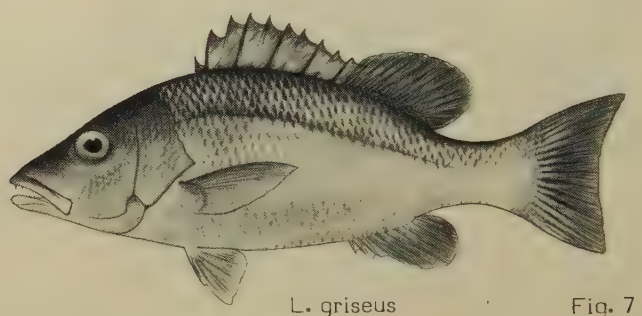
7a. Pectoral fin length about equal to distance from tip of snout to posterior edge of preopercle, 3.7 to 4.2 times in standard length; body comparatively slender, its greatest depth 2.6 to 3.2, usually 2.7 to 3.1 times in standard length ..... L. **griseus** (Fig. 7)

7b. Pectoral fin longer than distance from tip of snout to posterior edge of preopercle, 3.0 to 3.5 times in standard length (in L. apodus of 7.5 to 9.6 cm standard length, pectoral fin length approximately equal to that of L. griseus of similar size); body comparatively deep, greatest depth 2.3 to 2.8, usually 2.4 to 2.7 times in standard length

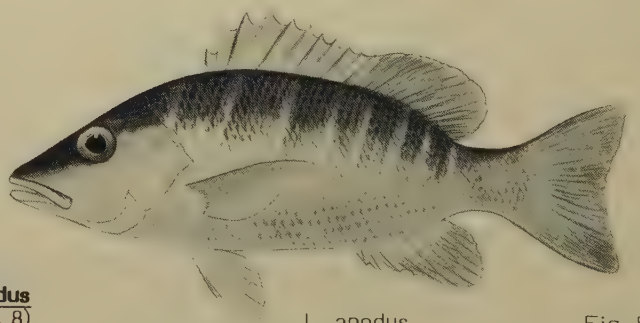
8a. Scales relatively large, 39 to 44, usually 40 to 43 transverse rows between upper edge of opercle and caudal base; 5 to 7 scales between dorsal origin and lateral line in a posteroventrally directed row (i.e. counting downward and backward); no whitish bar below eye ... L. **apodus** (Fig. 8)

shapes of vomerine tooth patch Fig. 5

L. ambiguus Fig. 6



L. griseus Fig. 7



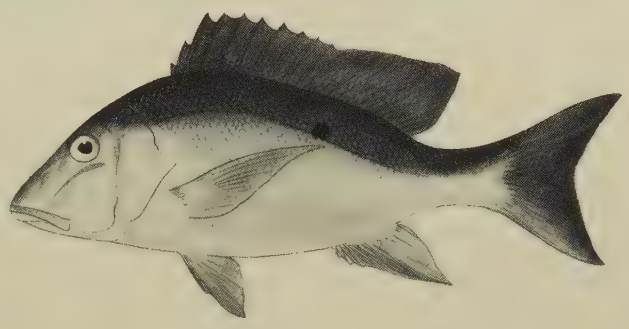
L. apodus Fig. 8

8b. Scales of moderate size, 45 to 49, usually 46 to 48, transverse rows between upper edge of opercle and caudal base; 8 to 11 scales between dorsal origin and lateral line in a posteroventrally directed row (i.e. counting downward and backward); a whitish bar between eye and area immediately posterior to maxilla (not obvious in some preserved specimens) ..... **L. jocu** (Fig. 9)

L. jocu Fig. 9

4b. Anal fin angulated in larger specimens, the middle rays produced, the longest almost half to greater than half the length of head (anal fin rounded in L. analis less than about 4 cm standard length, in L. campechanus and L. purpureus less than about 5 cm standard length, and in L. vivanus less than about 6 cm standard length); a black spot below anterior part of soft dorsal fin, at least in young (this spot present in large L. analis, to at least 46.5 cm standard length, but disappearing by about 20 to 30 cm standard length in L. campechanus, L. purpureus and L. vivanus)

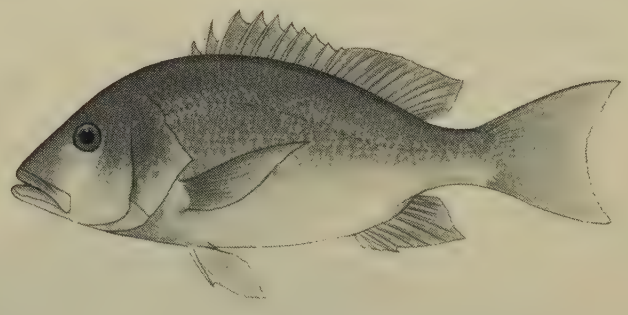
9a. Vomerine tooth patch without a distinct medial posterior extension (Fig. 5, column a); anal soft rays usually 8 (rarely 7); iris red in life; spot below anterior part of soft dorsal fin relatively large in small specimens, small but distinct in large specimens ..... **L. analis** (Fig. 10)



L. analis Fig. 10

9b. Vomerine tooth pach triangular or anchor-shaped, with a medial posterior extension (Fig. 5, columns b, c); anal soft rays 7 to 9 (usually 8 or 9)

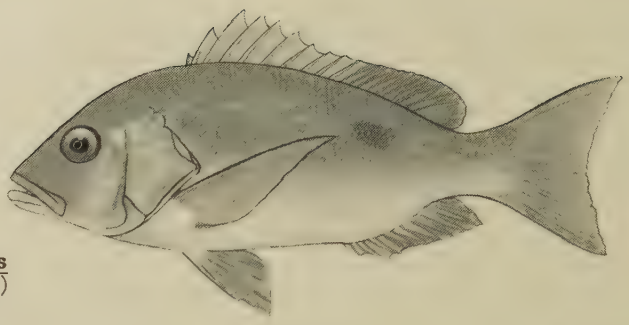
10a. Anal soft rays 9 (rarely 8); lateral line scales 46 to 50, usually 47 to 49; scales above lateral line 7 to 10, usually 8 or 9; scales on sides of anterior part of body, below lateral line, conspicuously larger than those on posterior part; suborbital width 8 or 9% of standard length ..... **L. campechanus** (Fig. 11)



L. campechanus Fig. 11

10b. Anal soft rays 8 (rarely 7 or 9); lateral line scales 49 to 53, usually 50 or 51; scales above lateral line 9 to 12, usually 10 to 12; scales on sides of anterior part of body, below lateral line, not conspicuously larger than those on posterior part; suborbital width 6 to 7% of standard length

11a. Scales below lateral line 16 to 19; scales above lateral line 9 to 11, usually 10; cheek scale rows 6, rarely 5 or 7; scales above lateral line, on anterior part of side of body, smaller than those below; pelvic fin length 53 to 62% of standard length; lateral spot on upper side of young about equal to, or larger than eye; iris red in live and freshly preserved specimens ..... L. **purpureus** (Fig. 12)



L. purpureus Fig. 12

11b. Scales below lateral line 20 to 24, usually 21 to 23; scales above lateral line 10 to 12, usually 11 or 12; cheek scale rows 7, rarely 8; scales above lateral line, on anterior part of side of body, about equal to those below; pelvic fin length 63 to 76% of standard length, lateral spot on upper side of young smaller than eye; iris yellow in live and freshly preserved specimens ..... L. **vivanus** (Fig. 13)

L. vivanus Fig. 13

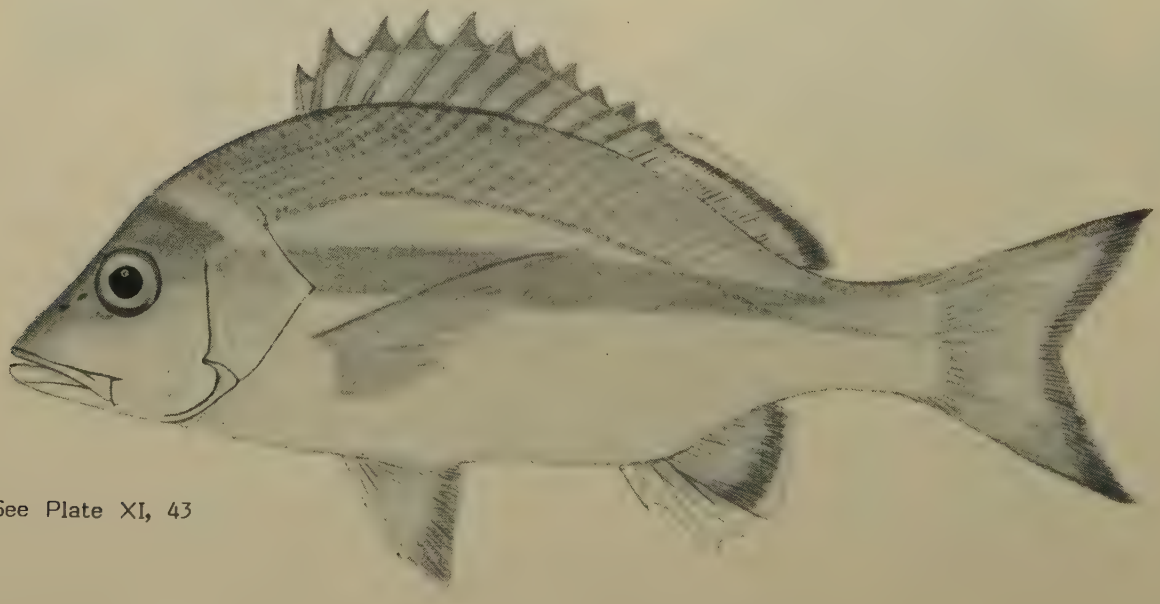
Lutjanus adetii (Castelnau, 1873)

LUT Lut 43

Diacope adetii Castelnau, 1873, Proc.Zool.Acclim.Soc.Victoria, 2:111 (Noumea, New Caledonia).

Synonyms : Genyoroge unicolor Alleyne & Macleay (1877); Genyoroge amabilis De Vis (1885); Lutjanus castelnaui Whitley (1928); Lutjanus paravitta Postel (1965).

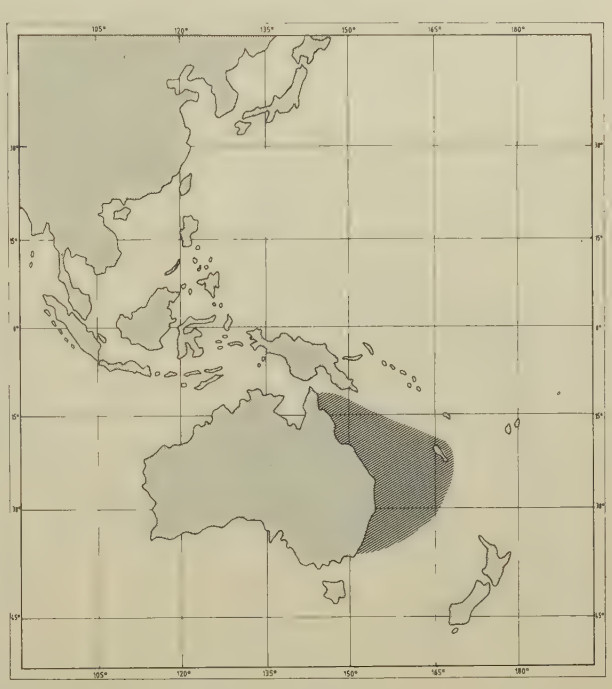
FAO Names : En - Yellow-banded snapper; Fr - Vivaneau de nuit; Sp - Pargo nochero.



See Plate XI, 43

Diagnostic Features : Body relatively deep (greatest depth 2.5 to 2.7 times in standard length). Snout somewhat pointed; preorbital bone relatively broad, wider than eye diameter; preopercular notch and knob moderately well developed; vomerine tooth patch triangular, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb (including rudiments) 19 or 20, total rakers on first arch 27 to 29. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 17 rays; caudal fin emarginate or slightly forked. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides olive-brownish; lower sides and belly whitish to pink; a prominent yellow to golden-brown stripe along middle of sides; eye surrounded by yellow or orange.

Geographical Distribution : Restricted to the east coast of Australia and New Caledonia. The main Australian distribution is off southern Queensland between Cape Moreton (about 27°S) and the Capricorn Group (23°S).



Habitat and Biology : Mainly a coral reef species, sometimes forming large aggregations around rocky outcrops during daylight hours. At New Caledonia spawning occurs from August to February with peak activity during November to January.

Size : Maximum total length about 50 cm, common to about 30 cm. Matures at about 20 to 30 cm.

Interest to Fisheries : Mainly of interest to recreational fishermen, but sometimes appearing in fish markets, particularly at New Caledonia. Good eating and usually marketed fresh. Caught with hook-and-line; also with gill nets.

Local Names : AUSTRALIA: Hussar, Yellow-banded sea perch; NEW CALEDONIA: Lutjan aimable, Rouget de nuit.

Literature : Grant (1982); Allen & Talbot (1985).

Remarks : Usually referred to as Lutjanus amabilis by previous authors.

Lutjanus agennes Bleeker, 1863

LUT Lut 24

Lutjanus agennes Bleeker, 1863, Natuurk.verh.Holland.Maatsch.Wet., Haarlem, 18(2):49 (Ashantee, Guinea).

Synonyms : Lutjanus modestus Bleeker (1863).

FAO Names : En - African red snapper; Fr - Vivaneau africain rouge; Sp - Pargo colorado africano.

See Plate VI, 21

Diagnostic Features : Body relatively deep. Head pointed, dorsal profile of forehead somewhat angular; preorbital bone broad in adults; maxilla extending nearly to mid-eye level; preopercular notch and knob weak; vomerine tooth patch triangular, sometimes with a medial posterior extension; gill rakers on lower limb of first arch about 13 (4 or 5 are very low rudiments), total rakers on first arch about 21. Dorsal fin with 10 spines and 14 (rarely 13) soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins of adults not reaching level of anus with 16 rays; caudal fin slightly emarginate or truncate. Scales moderate-sized, about 43 to 48 in lateral line; scale rows on back parallel to lateral line; scales between lateral line and base of dorsal fin (at middle of spinous portion) 4; scale rows on cheek 5 or 6. Colour: reddish brown to slightly orange on back and upper sides, grading to whitish on lower sides and belly; tips of pelvic fins very dark; juveniles with a series of about 6 to 8 vertical rows of small white spots or narrow bars on side.

Geographical Distribution : West African coast between Senegal and Angola.

Habitat and Biology : Inhabits rocky bottoms and coral reefs; also common in brackish lagoons and found in rivers, particularly the juveniles.

Size : Maximum total length to at least 75 cm, common to 50 cm.

Interest to Fisheries : An important food fish in the subsistence fishery. caught with handlines and fixed bottom nets. Marketed mainly fresh.

Local Names : GUINEA: Bammaroni, Kinsidini, Wali; IVORY COAST: Edion-si, Késan, Kpéna; SENEGAL: Diabar, Yâkh; TOGO: Haha.

Literature : Delais (1952); Boeseman (1963); Bauchot & Daget (1967); Fischer, Bianchi & Scott (eds) (1981).

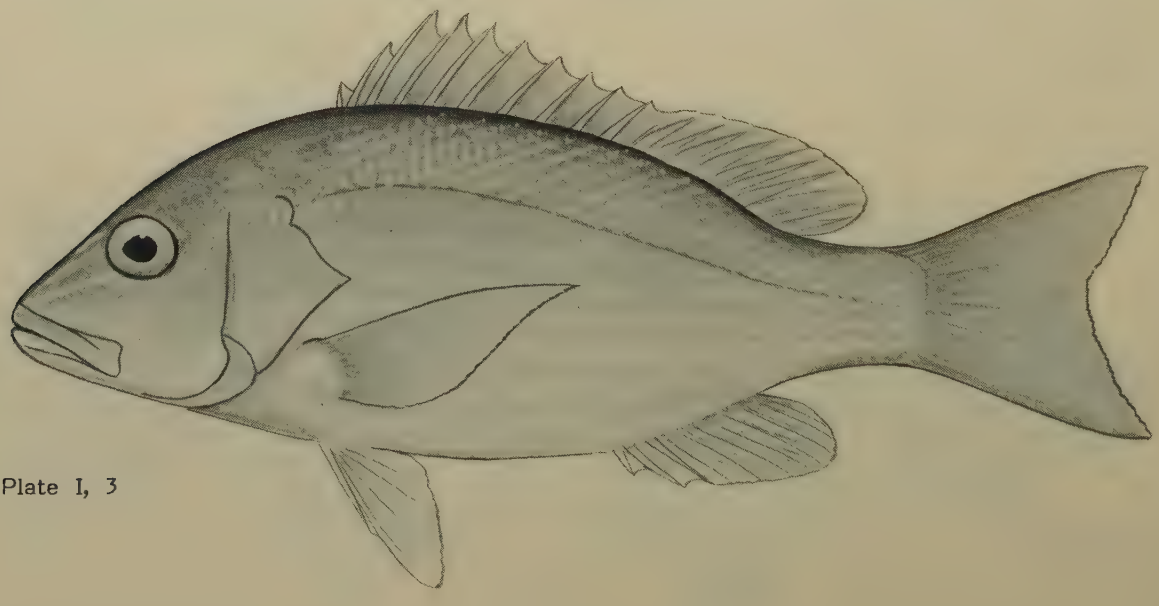
Lutjanus ambiguus (Poey, 1860)

LUT Lut 44

Mesoprion ambiguus Poey, 1860, Memorias, 2:152 (Cuba).

Synonyms : None.

FAO Names : En - Ambiguous snapper; Fr - Vivaneau ambigu; Sp - Pargo ambiguo.



See Plate I, 3

Diagnostic Features : Body relatively slender; preopercular notch and knob weak; teeth at front of upper jaw enlarged as canines, those of lower jaw smaller; vomerine tooth patch V-shaped or crescentic, with a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 16, total rakers on first arch 24. Dorsal fin with 10 spines and 13 soft rays; anal fin with 3 spines and 9 soft rays; pectoral fins long, extending to level of anus; caudal fin forked. Scale rows on back rising obliquely above lateral line. Colour: back and sides pink to reddish, with series of oblique narrow, yellow stripes; lower sides and belly lighter, with narrow yellow horizontal stripes; fins yellowish to reddish.

Geographical Distribution : Currently known only from Cuba and southern Florida, but probably widespread in the Caribbean Sea.

Habitat and Biology : Poorly known, but apparently inhabits deep reefs.

Size : The few known specimens are under 40 cm total length.

Interest to Fisheries : Presumably of no commercial importance.

Local Names : -

Literature : Jordan & Swain (1885); Jordan & Evermann (1896); Rodriguez Pino (1961).

Remarks : Formerly thought to be a possible hybrid of Lutjanus synagris and Ocyurus chrysurus.

Lutjanus analis (Cuvier, 1828)

LUT Lut 13

Mesoprion analis Cuvier (in C. & V., 1828), Hist.Nat.Poiss., 2:452 (San Domingo).

Synonyms : Mesoprion sobra Cuvier (in C. & V., 1828); Mesoprion isodon Valenciennes (in C. & V., 1833); Mesoprion rosaceus Poey (1870).

FAO Names : En - Mutton snapper; Fr - Vivaneau sorbe; Sp - Pargo criollo.

See Plate I, 4

Diagnostic Features : Body moderately deep; preopercular notch and knob weak; canine teeth in both jaws relatively small; vomerine tooth patch V-shaped or crescentic, without a medial posterior extension. Dorsal fin with 10 spines and 14 soft rays (rarely 11 spines and 13 soft rays); anal fin with 3 spines and 8 (rarely 7) soft rays;

pectoral fins long, reaching level of anus with 16 (rarely 15 or 17) soft rays; anal fin pointed. Scales rows on back rising obliquely above lateral line; scales between lateral line and base of dorsal fin (at middle of spinous portion) 4; scale rows on cheek 5 or 6. Colour: back and upper sides olive green, whitish with a red tinge on lower sides and belly; a black spot, about pupil size, on upper back, just above lateral line, and below anterior soft dorsal rays; a pair of blue stripes on snout-cheek region, the upper continuing behind eye to upper opercle edge; dorsal and upper lobe of caudal fin olive; pectoral fins, pelvic fins, anterior part of anal fin and lower lobe of caudal fin red.

Geographical Distribution : Tropical western Atlantic Ocean as far north as Massachusetts and southward to southeastern Brazil; introduced in waters around Bermuda. It is most abundant around the Antilles, the Bahamas and off southern Florida.

Habitat and Biology : Found most commonly over vegetated sand bottoms and in bays and estuaries along mangrove coasts; also occurs around coral reefs. Forms small aggregations which disband during the night. Feeds both day and night on fishes, shrimps, crabs, cephalopods, and gastropods. Spawning has been recorded during February in the northeastern Caribbean. Estimated maximum age: 8 to 9 years.

Size : Maximum total length about 80 cm; common to 50 cm. Matures at about 40 to 50 cm.

Interest to Fisheries : A valuable commercial fish with flesh of exceptionally good quality. Caught mainly with boat seines, gill nets, and bottom longlines; also with handlines and traps or speared by divers. Marketed mainly fresh or frozen.

Local Names : COLOMBIA: Pargo cebado, Pargo mulato; CUBA: Pargo criollo; MARTINIQUE: Sorbe; MEXICO: Pargo colorado, Pargo criollo; VENEZUELA: Pargo cebal.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Fischer (ed) (1978).

Lutjanus apodus (Walbaum, 1792)

LUT Lut 14

Perca apoda Walbaum, 1792, Artedi Piscium:351 (Bahamas).

Synonyms : Sparus caxis Bloch & Schneider (1801); Bodianus striatus Bloch & Schneider (1801); Bodianus albostriatus Bloch & Schneider (1801); Bodianus fasciatus Bloch & Schneider (1801); Lutjanus acutirostris Desmarest (1823); Mesoprion cynodon Cuvier (in C. & V., 1828); Mesoprion linea Cuvier (in C. & V., 1828).

FAO Names : En - Schoolmaster snapper; Fr - Vivaneau dentchien; Sp - Pargo amarillo.

See Plate II, 5

Diagnostic Features : Body moderately deep. Snout long and pointed, mouth large; one of the upper pairs of canine teeth notably enlarged, visible when mouth is close; preopercular notch and knob weak; vomerine tooth patch V-shaped or crescentic with a medial posterior extension. Dorsal fin with 10 spines and 14 soft rays; anal fin rounded with 3 spines and 8 soft rays; pectoral fins long, reaching level of anus; caudal fin slightly emarginate or truncate. Scale rows on back parallel to lateral line, at least anteriorly; scale rows on cheek 5 or 6. Colour: olive grey to brownish on upper back and sides; eight narrow, pale vertical bars on sides (may be faint or absent in large adults; a solid or broken blue line under eye that may disappear with growth; fins mainly yellow.

Geographical Distribution : Tropical western Atlantic Ocean as far north as Massachusetts and south to Trinidad and northern Brazil. Rare north of Florida.

Habitat and Biology : Inhabits shallow coastal waters over a variety of bottoms including coral reefs, vegetated sand, and mud in mangrove areas. Young sometimes enter brackish waters. Sometimes forms resting aggregations during the day. Feeds on fishes, shrimps, crabs, worms, gastropods, and cephalopods.

Size : Maximum total length about 62 cm; common to 35 cm. Matures at about 30 cm.

Interest to Fisheries : Caught mainly with beach seines, gill nets, traps and handlines. Good eating. Marketed fresh and frozen.

Local Names : COLOMBIA: Maestro; Pargo común; CUBA: Cají; MARTINIQUE: Pagre dentchien; PUERTO RICO, SANTO DOMINGO: Pargo amarillo; VENEZUELA: Pargo cotorro.

Literature : Jordan & Evermann (1896); Anderson (1967); Fischer (ed.) (1978).

Lutjanus aratus (Günther, 1864)

LUT Lut 45

Mesoprion aratus Günther, 1864, Proc.Zool.Soc.Lond., 1864:145 (Panama; Chiapas).

Synonyms : None.

FAO Names : En - Mullet snapper; Fr - Vivaneau radis; Sp - Pargo raicero.

See Plate VII, 27, 27a

Diagnostic Features : Preopercular notch and knob moderate; vomerine tooth patch V-shaped or crescentic, without a medial posterior extension; granular teeth on tongue; gill rakers on lower limb of first arch (including rudiments) 11 or 12, total rakers on first arch 16 or 17. Dorsal fin with 11 or 12 spines and 12 soft rays; anal fin with 3 spines and 7 or 8 soft rays; posterior profile of soft dorsal and anal fins rounded; pectoral fins with 15 rays; caudal fin truncate. Scale rows on back parallel to lateral line. Colour: dark grey-green on back, centre of each scale yellowish-white forming alternating dark and light stripes on sides; belly lighter; some bluish on cheeks, silvery on underside of head and throat; fins mainly grey. However, individuals from deeper waters are mainly reddish (see colour plate).

Geographical Distribution : Eastern Pacific Ocean from Mexico to Ecuador.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 55 cm.

Interest to Fisheries : Mainly local subsistence fishery. Caught with handlines and marketed fresh.

Local Names : COLOMBIA: Pargo; COSTA RICA: Pargo, Pargo jilguero; ECUADOR: Pargo; MEXICO: Pargo colorado, Pargo raicero, Pargo rayado; PANAMA: Pargo de jilguero, Pargo jilguero.

Literature : Jordan & Evermann (1896).

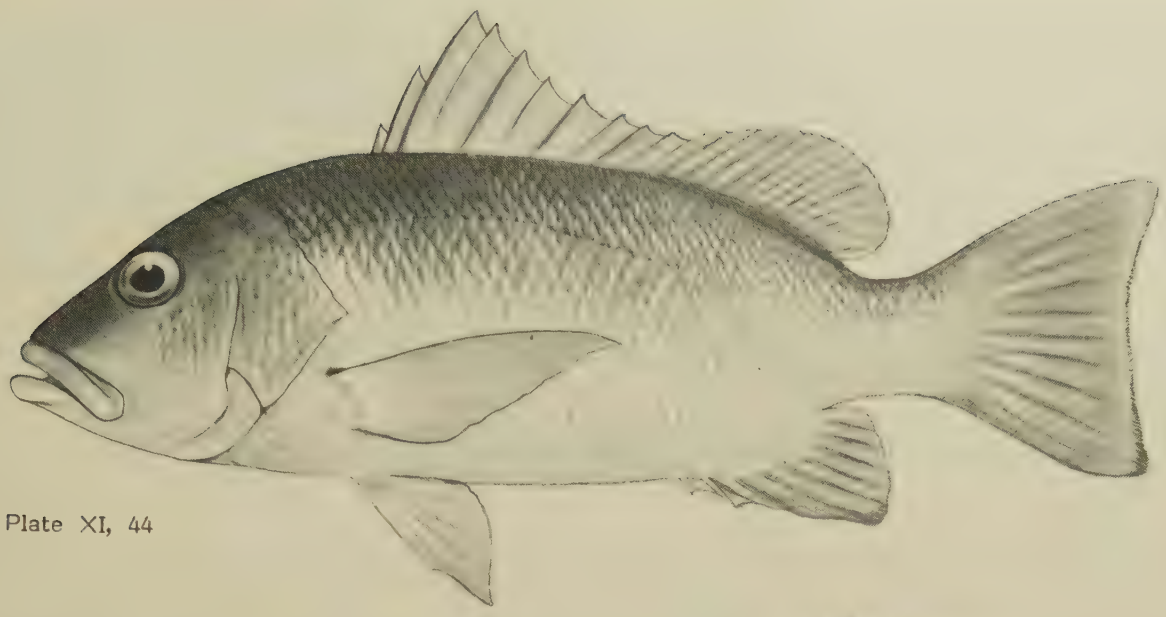
Lutjanus argentimaculatus (Forsskål, 1775)

LUT Lut 1

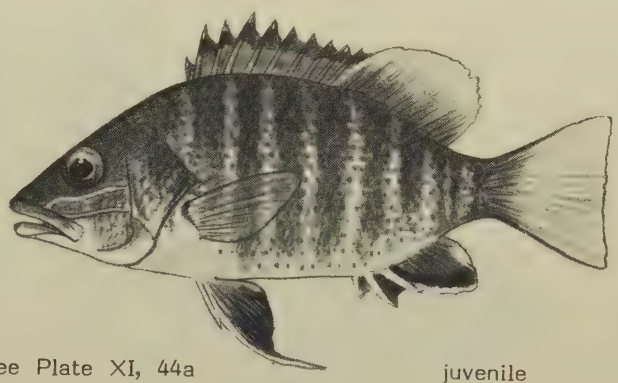
Sciaena argentimaculatus Forsskål, 1775, Descrip-animal-, :xi, 47 (Arabia).

Synonyms : Sciaena argentata Gmelin (1789); Alphestes gembra Schneider (in Bloch & Schneider, 1801); Mesoprion flavipinnis Cuvier (in C. & V., 1828); Mesoprion olivaceus Cuvier (in C. & V., 1828); Mesoprion taeniops Valenciennes (in C. & V., 1830); Mesoprion griseoides Guichenot (1862); Mesoprion garretti Günther (1873); Lutianus johngarah Day (1875); Diacope superbus Castelnau (1878); Mesoprion obscurus Macleay (1881); Mesoprion roseigaster Macleay (1881); Mesoprion sexfasciatus Macleay (1883); Lutianus salmonoides Gilchrist & Thompson (1908).

FAO Names : En - Mangrove red snapper; Fr - Vivaneau des mangroves; Sp - Pargo de manglar.



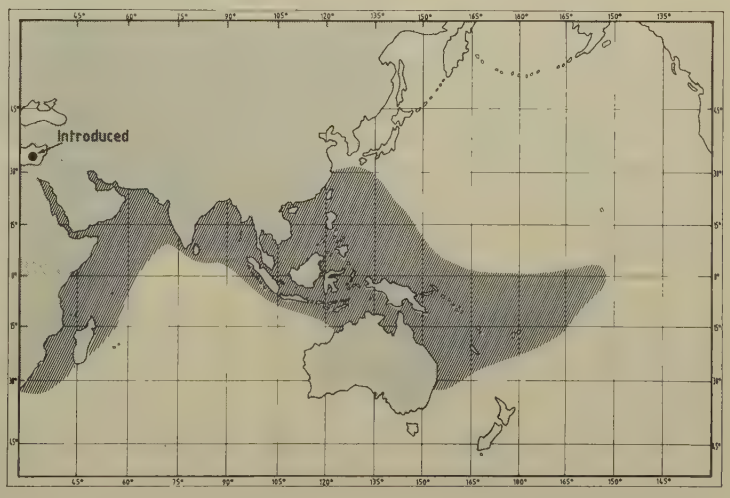
See Plate XI, 44



See Plate XI, 44a juvenile

Diagnostic Features : Body moderately deep (greatest depth 2.5 to 3.1 times in standard length). Snout somewhat pointed; preorbital bone relatively broad, wider than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 9 to 12, total gill rakers on first arch 16 to 20. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin emarginate to nearly truncate. Scale rows on back more or less parallel to lateral line, or parallel below spinous part of dorsal fin and sometimes rising obliquely posteriorly, or rarely with entirely oblique rows. Colour: back and sides greenish-brown to reddish; belly silvery or whitish; specimens from deep water frequently overall reddish; juveniles with a series of about eight whitish bars crossing sides, and 1 or 2 blue lines across cheek.

Geographical Distribution : Widespread in the Indo-West Pacific from Samoa and the Line Islands to East Africa, and from Australia northward to the Ryukyu Islands. Has dispersed into the eastern Mediterranean (off Lebanon) via the Suez Canal, but is not well established there.



Habitat and Biology : Juveniles and young adults found in mangrove estuaries and in the lower reaches of freshwater streams. Eventually they migrate offshore to deeper reef areas, sometimes penetrating to depths in excess of 100 m. Habitat frequently consists of areas of abundant shelter in the form of caves or overhanging ledges. Feeds mainly on fishes and crustaceans. Spawning occurs throughout the year, at least in lower latitudes.

Size : Maximum total length about 120 cm; common to 80 cm.

Interest to Fisheries : An important market species throughout the Indo-Pacific region, but never found in large quantities. Caught mainly with handlines, bottom longlines, and trawls. In 1983 a total catch of 9 814 metric tons was reported to FAO (Fishing Areas 51 and 71). Marketed mostly fresh; also dried-salted.

Local Names : AUSTRALIA: Mangrove Jack; JAPAN: Goma-fueda; LACCADIVE ISLANDS: Banda; MADAGASCAR: Barahoa, Fiamasiaka, Mena, Varavara, Zoho; NEW CALEDONIA: Rouget; PALAU: Kedesaulyengl; SAMOA: Mu-taiva; SOUTH AFRICA: River snapper, Rivier-snapper; SRI LANKA: Adallu, Thambalaya; TANZANIA: Chazanda, Kula-kula, Unga; THE PHILIPPINES: Aliso, Bambangin, Batungal, Bolidao, Daranq-darag, Gingao, Lodong, Kalumbang, Kisang, Mangagat, Tadlungan, Talungan.

Literature : Grant (1982); Fischer & Bianchi (eds) (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

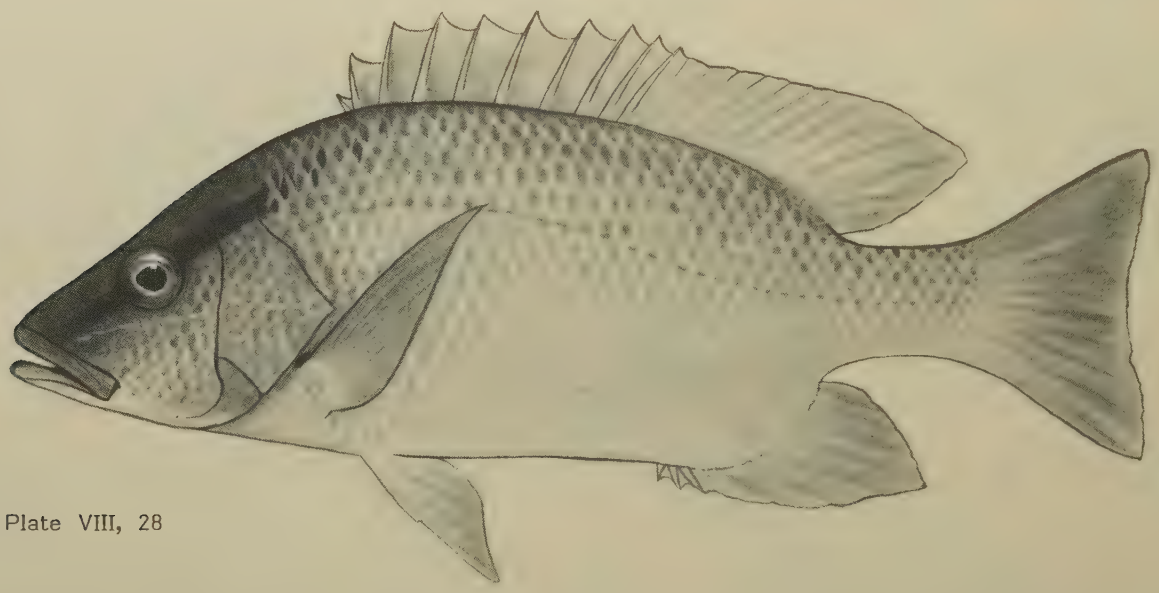
Lutjanus argentiventris (Peters, 1869)

LUT Lut 46

Mesoprion argentiventris Peters, 1869, Berlin, Monatsber., 704 (Mazatlán, Mexico).

Synonyms : None.

FAO Names : En - Yellow snapper, Amarillo snapper; Fr - Vivaneau jaune; Sp - Pargo amarillo.



See Plate VIII, 28

Diagnostic Features : Body relatively deep, moderately compressed. Forehead sloping steeply; snout somewhat pointed; preopercular notch and knob weak; vomerine tooth patch triangular or crescentic with an elongate medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb (including rudiments) of first arch 12 or 13. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded to angular; pectoral fins with 16 or 17 rays; caudal fin emarginate. Scale rows on back parallel to lateral line. Colour: rosy red anteriorly becoming bright orange to yellow over most of body; fins mainly yellow or orange; inside of mouth white; a bluish horizontal streak below eye.

Geographical Distribution : Eastern Pacific Ocean from southern California to Peru, rare north of Baja California; also at the Cocos and Galapagos Islands.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms. Often forming aggregations during daylight or sheltering as solitary fish in caverns. Feeds, both day and night, on fishes shrimps, crabs and molluscs.

Size : Maximum total length about 55 cm.

Interest to Fisheries : Caught throughout its range with nets, trawls, and handlines. In 1983 a total catch of 3 632 metric tons was reported to FAO (Fishing Area 77). It is marketed either fresh or frozen.

Local Names : COLOMBIA: Pargo mulatillo, Pargo rojo; COSTA RICA: Pargo amarillo, Pargo coliamarillo, Pargo colorado; ECUADOR: Pargo blanco, Pargo dentón, Pargo dientón; EL SALVADOR: Boca colorada, Guachinango, Pargo, Pargo amarillo, Parvo; GUATEMALA: Huachinango, Pargo amarillo; MEXICO: Huachinango, Pargo, Pargo amarillo, Pargo de manglar; Nicaragua: Boca colorada; PANAMA: Pargo, Pargo rosquero; PERU: Pargo amarillo, Pargo blanco, Pargo dentón, Parvo.

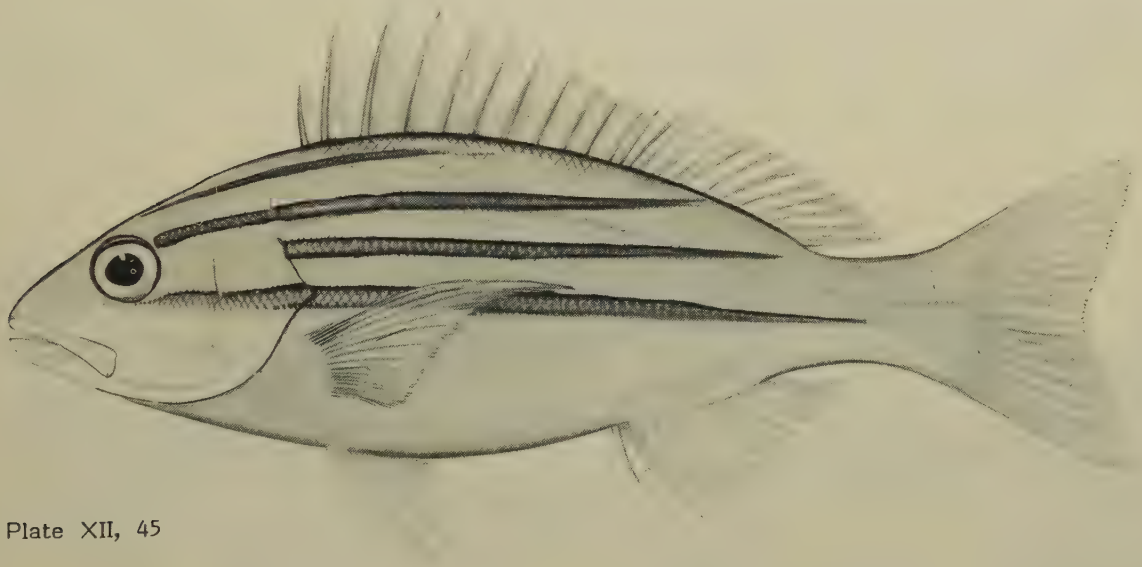
Literature : Jordan & Evermann (1896); Hildebrand (1946).

Lutjanus bengalensis (Bloch, 1790) LUT Lut 29

Holocentrus bengalensis Bloch, 1790, Naturg.Ausländ.Fische, 4:102 (Bengal).

Synonyms : Diacope octolineata Cuvier (in C. & V., 1828 - in part); Diacope octovittata Valenciennes (in C. & V., 1830); Mesoprion pomacanthus Bleeker (1855 - in part).

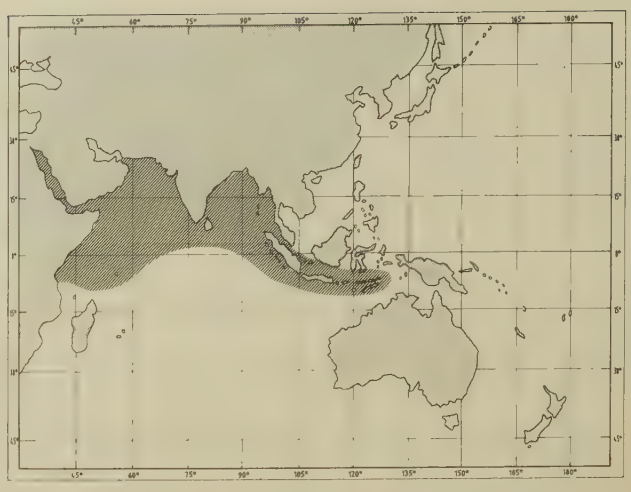
FAO Names : En - Bengal snapper; Fr - Vivaneau du Bengale; Sp - Pargo de Bengala.



See Plate XII, 45

Diagnostic Features : Body fusiform, slender to moderately deep (greatest depth 2.5 to 2.9 times in standard length). Snout somewhat pointed; preorbital bone relatively narrow; its width usually less than eye diameter; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 17 to 19, total gill rakers on first arch 26 to 28. Dorsal fin with 10 spines and 12 to 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile and anal fins moderately pointed; pectoral fins with 16 or 17 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and sides yellowish; belly whitish; sides with a series of 4 bright blue stripes; no black spot on back below middle of dorsal fin; fins yellow to whitish.

Geographical Distribution : Mainly tropical, northern Indian Ocean from Sumatra to East Africa and the Red Sea; occasionally found in Indonesia as far east as Ambon.



Habitat and Biology : Mainly a coral reef species found at depths between about 10 and 25 m; sometimes forming small aggregations around rocky outcrops and coral heads during daylight hours. Feeds mainly on fishes and crustaceans.

Size : Maximum total length about 30 cm; common to 20 cm.

Interest to Fisheries : Found in small quantities in most markets and not considered important, although the flesh is of good quality. Caught mainly with handlines, traps and gill nets. Marketed mostly fresh.

Local Names : TANZANIA: Janja.

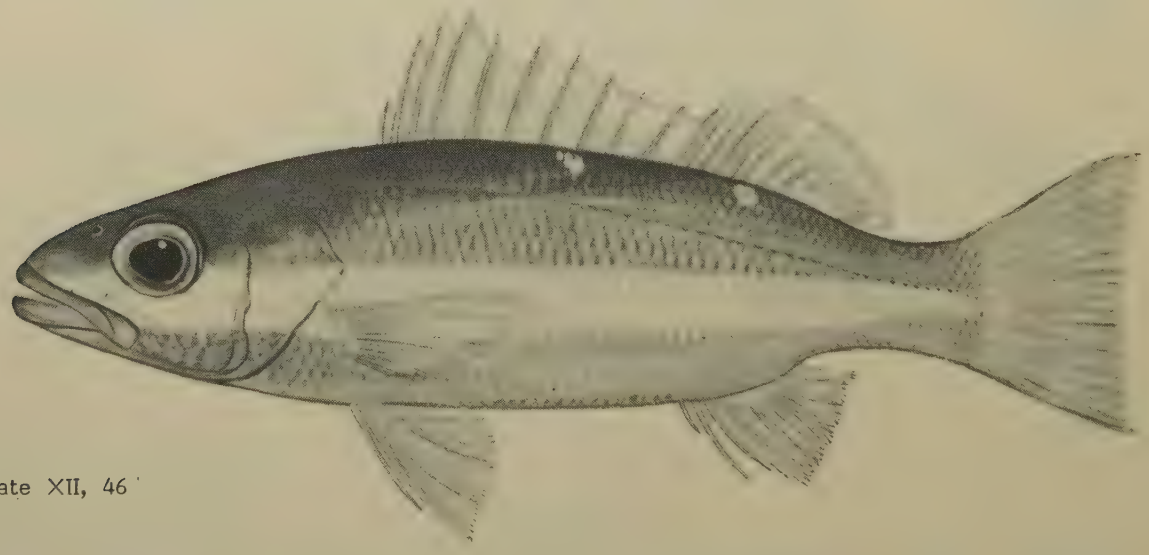
Literature : Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Allen & Talbot (1985).

Lutjanus biguttatus (Valenciennes, 1830) | LUT Lut 30

Serranus biguttatus Valenciennes (in C. & V.), 1830, Hist.Nat.Poiss., 6:507 (Trinquemale, Ceylon; Amboina).

Synonyms : Mesoprion elongatus Hombron & Jacquinot (in Jacquinot & Guichenot, 1853); Mesoprion bleekeri Günther (1859).

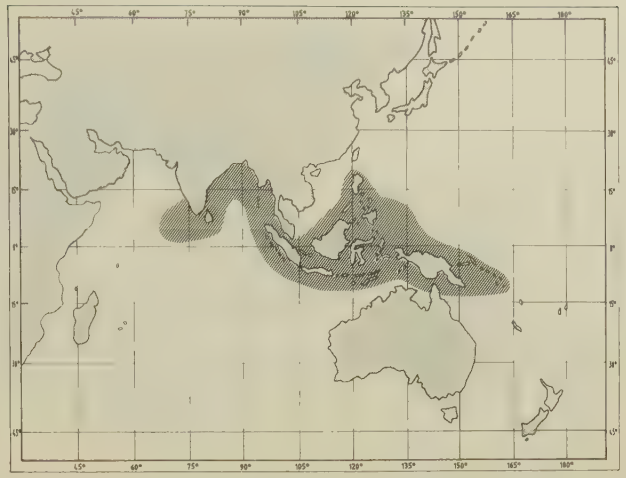
FAO Names : En - Two-spot banded snapper; Fr - Vivaneau à bande blanche; Sp - Pargo de banda blanca.



See Plate XII, 46

Diagnostic Features : Body fusiform, very slender (greatest depth 3.5 to 3.8 times in standard length). Snout profile low, sloping very gently; preorbital bone narrow, its width less than half of eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension, or diamond-shaped; tongue smooth without teeth; gill rakers on lower limb of first arch (including rudiments) 16 to 19, total gill rakers on first arch 23 to 25. Dorsal fin with 10 spines and 12 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins somewhat pointed or angular; pectoral fin with 15 or 16 rays; caudal fin truncate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides dark brown; lower sides and belly golden-brown to yellowish; a broad pearly-white stripe from below eye to base of caudal fin; two small white spots on upper back, one below base of 7th dorsal spine and one below middle of soft part of dorsal fin.

Geographical Distribution : Mainly the Indo-Australian Archipelago from the Solomon Islands to Sumatra, and from off Cape York Peninsula, Australia, northward to the Philippines; also occurring in the central and eastern Indian Ocean as far west as the Maldive Islands.



Habitat and Biology : Inhabits coral reefs at depths between about 5 and 25 m. Sometimes occurs in large schools of more than 100 individuals. Feeds mainly on small fishes and crustaceans.

Size : Maximum total length about 20 cm; common to 15 cm.

Interest to Fisheries : An important market fish in some areas such as Sri Lanka, but generally marketed in small quantities. Caught mainly with handlines, traps, and gill nets. Marketed mostly fresh.

Local Names : PALAU: Kesebii; THE PHILIPPINES: Agahon, Labongan, Maransing, Maya-maya, Parguito.

Literature : Fischer & Bianchi (eds) (1984); Allen & Talbot (1985).

Lutjanus bitaeniatus (Valenciennes, 1830)

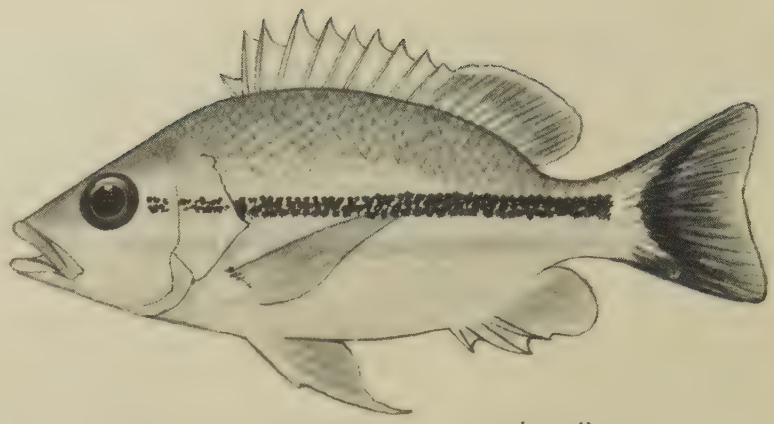
LUT Lut 47

Diacope bitaeniata Valenciennes (in C. & V.), 1830, Hist.Nat.Poiss., 6:536 (Celebes).

Synonyms : None.

FAO Names : En - Indonesian snapper; Fr - Vivaneau de l'Indonesie; Sp - Pargo de Indonesia.

See Plate XII, 47



juvenile

See Plate XII, 47a

Diagnostic Features : Body relatively deep (greatest depth 2.3 to 2.5 times in standard length). Snout somewhat pointed, dorsal profile of head sloping steeply; preorbital bone relatively narrow, its width usually slightly less than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 11 or 12, total rakers on first arch 18 or 19. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin slightly emarginate or truncate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides red; lower sides and belly pink or silvery-white; fins reddish except caudal sometimes dusky brown; juveniles with a black stripe along middle of sides and a blackish crescentic marking at base of caudal fin; belly, anal and pelvic fins of young frequently yellowish.

Geographical Distribution : Known only from a few specimens collected at Indonesia (off Sumatra and Sulawesi) and west of Kuri Bay, Western Australia.

Habitat and Biology : Inhabits deeper reef areas in depths between about 40 and 65 m. Occurs solitarily or in small groups.

Size : Maximum total length of known specimens about 30 cm, but probably grows larger.

Interest to Fisheries : Of potential interest, but presently caught in low numbers, mainly by experimental trawlers. The flesh is of good quality.

Local Names : -

Literature : Gloerfelt-Tarp & Kailola (1984); Allen & Talbot (1985).

Lutjanus bohar (Forsskål, 1775)

LUT Lut 20

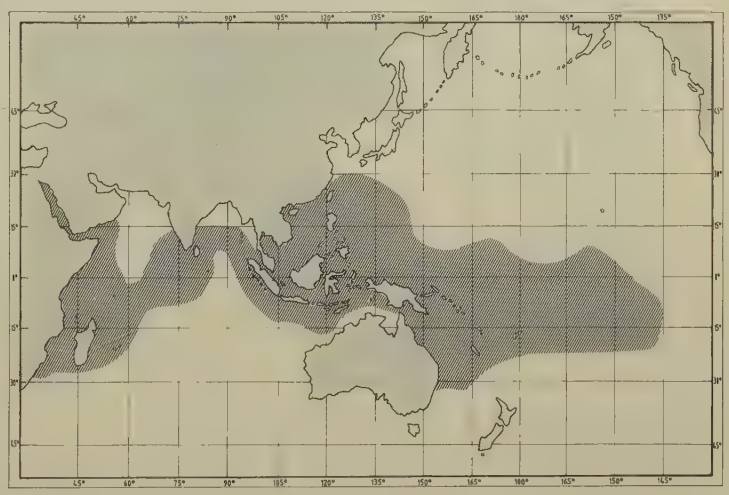
Sciaena bohar Forsskål, 1775, Descript.Animal:xi, 46 (Arabia).

Synonyms : Sparus lepisurus Lacepède (1802); Diacope quadriguttata Cuvier (in C. & V., 1828); Mesoprion rangus Cuvier (in C. & V., 1828); Diacope labuan Thiollière (in Montrouzier, 1856); Mesoprion rubens Macleay (1882); Lutianus nukuhivae Seale (1906); Lutjanus coatesi Whitley (1934).

FAO Names : En - Two-spot red snapper; Fr - Vivaneau chien rouge; Sp - Pargo de dos manchas.

See Plate XII, 48

Diagnostic Features : Body moderately deep (greatest depth 2.4 to 2.9 times in standard length). Snout somewhat pointed, dorsal profile of head rounded; preorbital bone relatively broad; its width usually greater than eye diameter; a deep groove or pit from nostrils to front of eye; preopercular notch and knob moderately developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 16, total rakers on first arch 22 or 23. Dorsal fin with 10 spines and 13 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides dark brown or blackish; lower sides and belly reddish, with darker horizontal stripes (between each scale row); fins mainly dusky except pectoral fins pink with dorsal edge prominently black; young and some adults with 2 silvery-white spots on back, one below middle of dorsal fin and one below base of last soft dorsal rays.



Geographical Distribution : Widespread in the Indo-West Pacific from the Marquesas and Line Islands to East Africa, and from Australia northward to the Ryukyu Islands. More common around oceanic islands than in continental areas.

Habitat and Biology : Inhabits coral reefs, including sheltered lagoons and outer reefs, usually at depths between about 10 and 70 m. Usually found solitarily, often adjacent to steep outer reef slopes. Feeds mainly on fishes, but also takes shrimps, crabs, stomatopods, amphipods, gastropods and urochordates. Spawning occurs throughout the year, at least in lower latitudes. Estimated maximum age: 13 years.

Size : Maximum total length about 75 cm, common to 50 cm. Matures at about 50 to 55 cm.

Interest to Fisheries : An important market fish in many localities and also important to subsistence fisheries. However, large specimens from oceanic areas in the western Pacific are often poisonous (ciguatera). Caught mainly with handlines and bottom longlines. Marketed mostly fresh; also dried salted.

Local Names : AUSTRALIA: Red bass; GILBERT ISLANDS: Te boingo (juveniles), Te ingo; GUAM: Tagafi; JAPAN: Bara-fuedai; LACCADIVE ISLANDS: Rymas, Pulariam; MADAGASCAR: Bobotsy, Fiamasiaka, Fiamena, Tsivaravara; NEW CALEDONIA: Lutjan rouge; PALAU: Kotongl; SAMOA: Mu, mu-a'a (dark phase, Mu-mea (red phase); SAUDI ARABIA: Bohar, Hamrah; SEYCHELLES: Vara-vara; SOUTH AFRICA: Tweekol-snapper, twin spot snapper; TAHITI: Ha'amea; TANZANIA: Kungu; THE PHILIPPINES: Ahaan, Bambangen, Katambak, Maya-maya, Tingayog; TUAMOTUS (Raroia): Tagau (small), Tatatata (medium), Mero mero (large).

Literature : Grant (1982); Fischer & Bianchi (eds) (1984); Masuda et al. (1984); Allen & Talbot (1985).

Lutjanus boutton (Lacepède, 1803)

LUT Lut 48

Holocentrus boutton Lacepède, 1803, Hist.Nat.Poiss., 4:331, 367 (Moluccas).

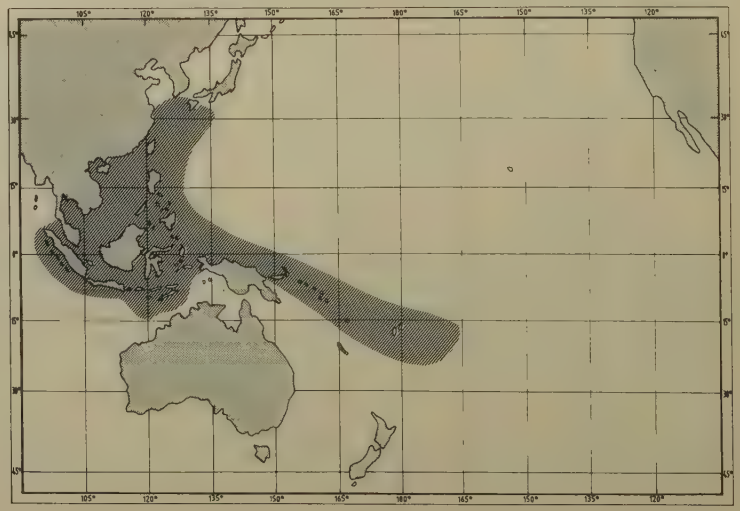
Synonyms : Diacope bottonensis Cuvier (in C. & V., 1828); Diacope rufolineata Valenciennes (in C. & V., 1830); Diacope amboinensis Bleeker (1852); Mesoprion melanospilos Bleeker (1852a); Diacope vitianus Hombron & Jacquinot (in Jacquinot & Guichenot, 1853); Mesoprion flaviroseus De Vis (1884); Lutianus luzonius Evermann & Seale (1906).

FAO Names : En - Moluccan snapper; Fr - Vivaneau des Moluques; Sp - Pargo de Molucas.

See Plate XIII, 49

Diagnostic Features : Body moderately deep (greatest depth 2.4 to 2.6 times in standard length). Snout somewhat pointed; eye large (3.5 to 4.2 times in head length); preorbital bone narrow, its width much less than eye diameter; preopercular notch and knob well developed; vomerine tooth patch in a crescentic band without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 13 to 15, total gill rakers on first arch 20 to 23. Dorsal fin with 10 or 11 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and sides pink or reddish; belly and underside of head white or silvery-white; usually a series of 10 to 12 faint yellow stripes on side; some specimens with a black spot (eye-sized or smaller) on back below anterior part of soft dorsal fin; fins mainly yellowish.

Geographical Distribution : Western Pacific Ocean from Samoa to Sumatra and northward to southern Japan; also in the eastern Indian Ocean off northwestern Australia.



Habitat and Biology : Inhabits coral reefs at depths between about 15 and 50 m. Often seen in schools of up to about 30 to 40 individuals. The diet includes fishes, shrimps, crabs, other crustaceans, cephalopods and some planktonic items. At Samoa, spawning occurs throughout the year with peak activity from March to June.

Size : Maximum total length about 30 cm, common to 20 cm.

Interest to Fisheries : Occasionally seen in markets. An important subsistence fish in many areas. Caught mainly with handlines and bottom longlines. Marketed fresh.

Local Names : JAPAN: Kyûssen-fuedai; NEW CALEDONIA: Jaunet; SAMOA: Savane-ulasama; THE PHILIPPINES: Agba-on, Matangal.

Literature : Gloerfelt-Tarp & Kailola (1984) Masuda et al. (1984, as L. caeruleovittatus); Shen (1984, as L. caeruleovittatus); Allen & Talbot (1985).

Remarks : Usually referred to as L. rufolineatus or sometimes as L. caeruleovittatus by previous authors.

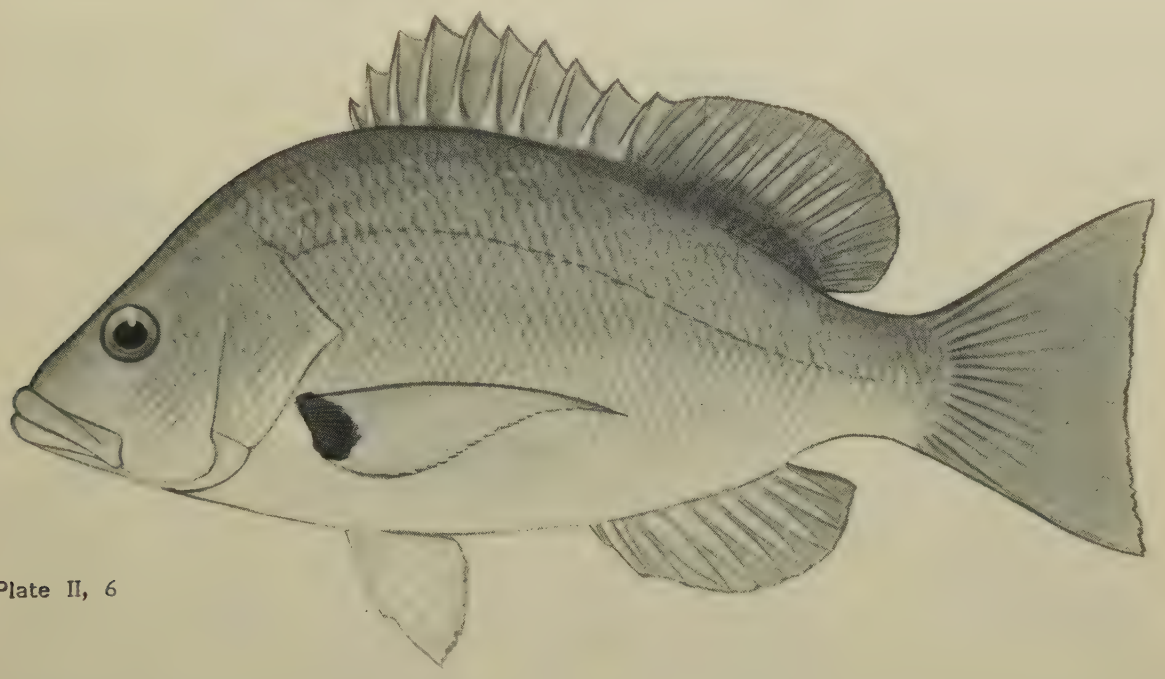
Lutjanus buccanella (Cuvier, 1828)

LUT Lut 15

Mesoprion buccanella Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:455 (Martinique).

Synonyms : Mesoprion caudanotatus Poey (1851).

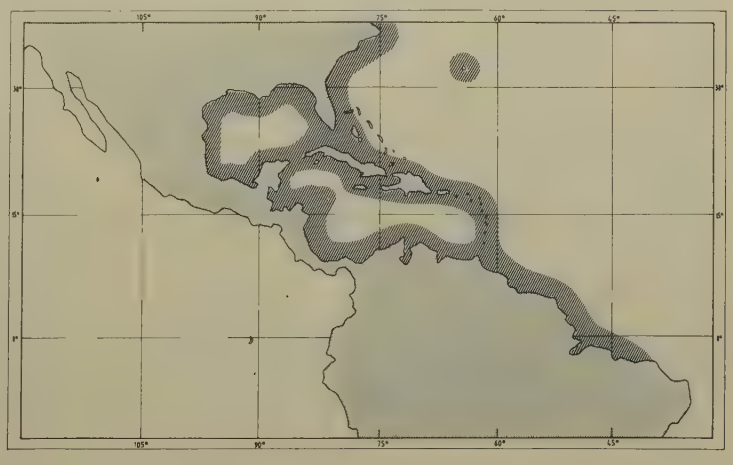
FAO Names : En - Blackfin snapper; Fr - Vivaneau oreille noire; Sp - Pargo sesí.



See Plate II, 6

Diagnostic Features : Body moderately deep. Preopercular notch and knob weak; upper canine teeth larger than lower; vomerine tooth patch V-shaped or crescentic, with a medial posterior extension. Dorsal fin with 10 spines and 14 soft rays; anal fin rounded, with 3 spines and 8 soft rays; pectoral fins long but not reaching level of anus, with 14 to 18 (usually 16 or 17) rays. Scale rows on back rising obliquely above lateral line. Colour: mainly scarlet red, silvery on lower sides and belly; iris orange; fins yellowish to orange, with a prominent black blotch at base and in axil of pectoral fins.

Geographical Distribution : Tropical western Atlantic as far north as North Carolina and south to Trinidad and northern Brazil. Very common in the Caribbean, particularly the Antilles.



Habitat and Biology : Adults inhabit deeper waters, usually between 80 and 150 m over sandy or rock bottoms and near drop-offs and ledges. Young are found in shallower waters, often between about 35 and 50 m. Feeds mainly on fishes. At Jamaica spawning occurs over most of the year with peak activity during April and September.

Size : Maximum total length about 62 cm, common to 50 cm. Matures at about 20 to 40 cm.

Interest to Fisheries : Caught mainly with multiple handlines and traps. Good eating. Marketed mostly fresh.

Local Names : CUBA: Sesí; MARTINIQUE: Oreille noire; PUERTO RICO, SANTO DOMINGO: Negra.

Literature : Jordan & Evermann (1896); Anderson (1967); Fischer (ed.) (1978).

Remarks : Occasionally implicated in cases of ciguatera fish poisoning.

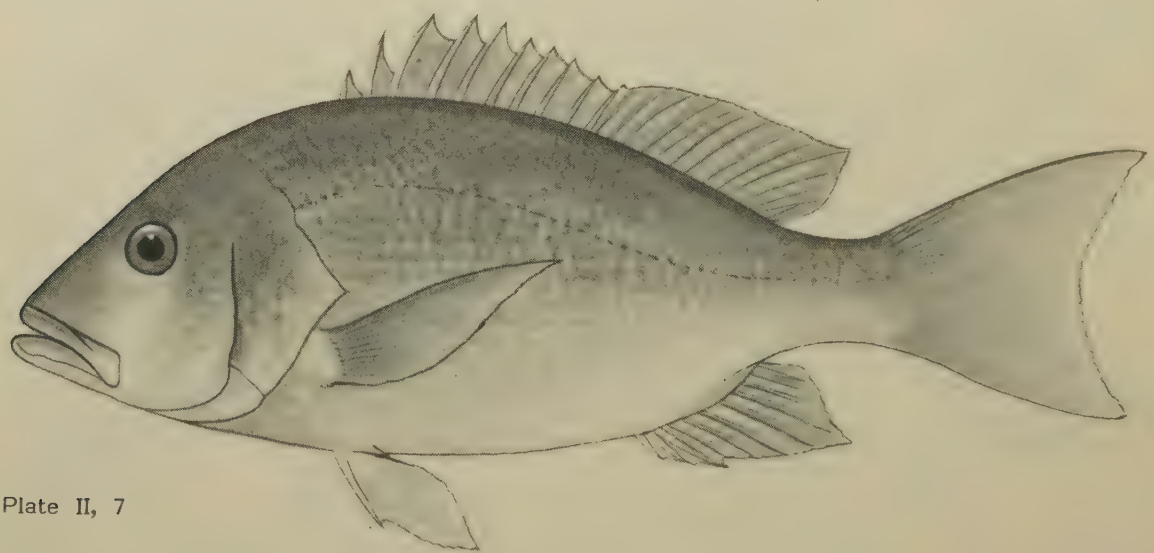
Lutjanus campechanus (Poey, 1860)

LUT Lut 16

Mesoprion campechanus Poey, 1860, Mem.Hist.Nat.Isla de Cuba, 2(49):149 (Campeche Bank; Key West).

Synonyms : Lutjanus campechianus Poey (1875); Lutjanus blackfordii Goode & Bean (1879).

FAO Names : En - Northern red snapper; Fr - Vivaneau campèche; Sp - Pargo del Golfo.



See Plate II, 7

Diagnostic Features : Body relatively deep. Eyes small (contained more than 6.5 times in head length); preorbital depth 8 or 9% of standard length; vomerine tooth patch V-shaped or crescentic, with a moderately developed medial posterior extension; tongue with two patches of granular teeth. Dorsal fin with 10 spines and 14 soft rays; anal fin pointed in specimens larger than 5 cm, with 3 spines and 9 (sometimes 8) soft rays; pectoral fins long, but not reaching level of anus, with 17 rays. Scale rows on back rising obliquely above lateral line. Colour: scarlet to brick red; specimens under about 30 to 35 cm with large dark spot on upper sides below anterior soft dorsal rays.

Geographical Distribution : Gulf of Mexico and Atlantic coast of the USA extending northward to Massachusetts, but rare north of the Carolinas.

Habitat and Biology : Adults are found over rocky bottoms at depths between 10 and 190 m, more commonly between 30 and 130 m. It generally occurs in deeper waters in the northern part of the range. Juveniles inhabit shallow waters, commonly over sand or mud bottoms. Feeds mainly on fishes, shrimps, crabs, worms, cephalopods, and some planktonic items including urochordates and gastropods. Spawning occurs from April to December with peak activity during June to August in the northwestern Gulf of Mexico and in August-September off southwestern Florida.

Eggs have a diameter of 0.77 to 0.85 mm and hatch in 20 to 27 hours (at 23 to 27°C). Estimated maximum age: 10 to 16 years.

Size : Maximum total length about 100 cm; common to 60 cm. Matures at about 30 to 40 cm.

Interest to Fisheries : This is one of the most important lutjanids in the Gulf fishery in terms of weight and value. In 1983 a total catch of 5 514 metric tons was reported to FAO (Fishing Area 31). Caught with bottom longlines, handlines, and bottom trawls. Marketed fresh and frozen.

Local Names : CUBA: Pargo colorado; MEXICO: Guachinango del Golfo.

Literature : Rivas (1966); Anderson (1967); Fischer (ed.) (1978).

Remarks : Sometimes referred to as Lutjanus aya by past authors, but Rivas (1966) provided evidence that indicates Bodianus aya Bloch (1790:45) is not a lutjanid, but probably a sciaenid.

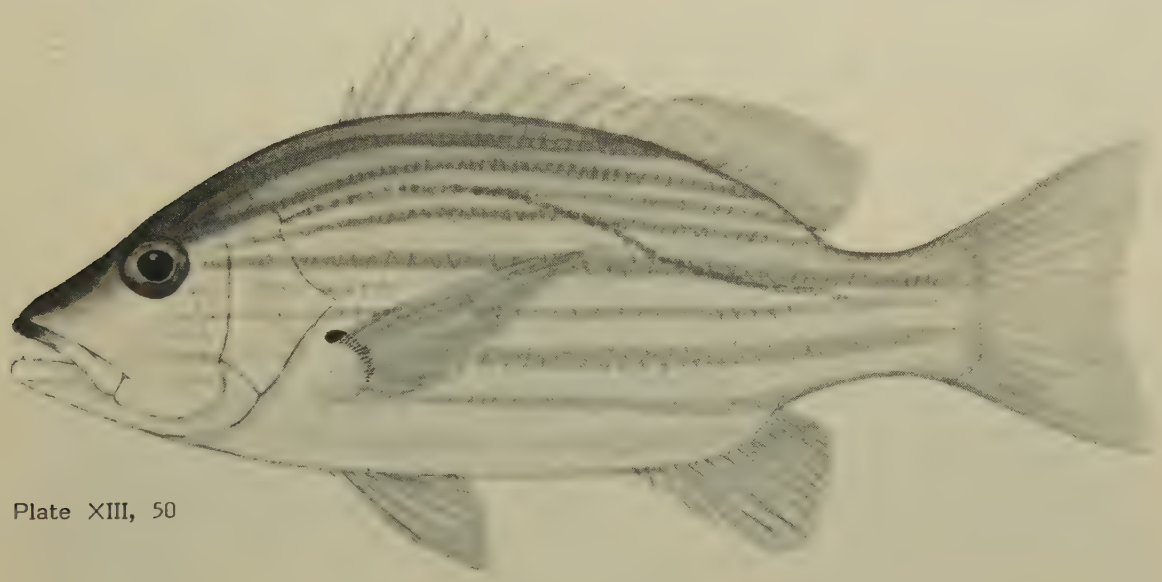
Lutjanus carponotatus (Richardson, 1842)

LUT Lut 49

Mesoprion carponotatus Richardson, 1842, Ann.Mag.Nat.Hist., 9:28 (Port Essington, Australia).

Synonyms : Mesoprion chrysotaenia Bleeker (1851); Mesoprion naborer Thiollère (in Montrouzier, 1856).

FAO Names : En - Spanish flag snapper; Fr - Vivaneau drapeau; Sp - Pargo abanderado.



See Plate XIII, 50

juvenile 8 cm

Diagnostic Features : Body moderately deep (greatest depth 2.4 to 2.7 times in standard length). Snout somewhat pointed, dorsal profile of head steeply sloped; preorbital bone about equal to eye diameter, or slightly wider; preopercular notch and knob poolry developed; vomerine tooth patch triangular, with a medial posterior extension, or diamond-shaped; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 8 to 11, total rakers on first arch 15 to 18. Dorsal fin with 10 spines and 14 to 16 soft rays; anal fin with 3 spines and 9 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 15 to 17 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides blue-grey or brownish; lower sides and belly white or yellow-white; a series of 8 or 9 orange, yellow, or golden-brown stripes on sides; fins yellowish; pectoral fin with a distinct black spot at base of uppermost rays and in axil. Trawl-captured specimens from deeper water may be pink with yellow stripes.

Geographical Distribution : Western Pacific and northeastern Indian Ocean, from northern Australia to India.

Habitat and Biology : Inhabits coral reefs in both sheltered lagoons and on outer reef slopes in depths between about 2 and 35 m. Also trawled to about 80 m depth. Often seen in schools of up to 20 to 30 individuals.

Size : Maximum total length about 40 cm; common to 30 cm.

Interest to Fisheries : Occasionally seen in markets. More important as a subsistence or recreational fish. Caught mainly with handlines or rod and reel (off Australia); also with traps and gill nets. Marketed fresh.

Local Names : AUSTRALIA: Spanish flag, Stripey; THE PHILIPPINES: Manila, Manilan-on, Maya-maya.

Literature : Grant (1982); Gloerfelt-Tarp & Kailola (1984); Allen & Talbot (1985).

Remarks : Sometimes referred to as L. chrysotaenia by previous authors.

Lutjanus coeruleolineatus (Rüppell, 1838)

LUT Lut 32

Diacope coeruleo-lineata Rüppell, 1838, Neve Wirbelth., Fische:93 (Massaua and Djedda, Red Sea).

Synonyms : None.

FAO Names : En - Blueline snapper; Fr - Vivaneau strié; Sp - Pargo estriado.

See Plate XIII, 51

Diagnostic Features : Body moderately deep (greatest depth 2.4 to 2.6 times in standard length). Snout somewhat pointed, dorsal profile of head moderately sloped; preorbital bone slightly narrower than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 14 or 15, total rakers on first arch 21 to 23. Dorsal fin with 10 spines and 12 to 14 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: back brownish; sides yellow, grading to white on belly; 7 or 8 blue longitudinal stripes on sides, the upper 4 slanting posteriorly toward dorsal fin base; a large blackish spot on back below anterior portion of soft dorsal fin; blue spots and broken lines on head; fins yellowish.

Geographical Distribution : Seas surrounding the Arabian Peninsula except the northern Red Sea and the "Gulf".

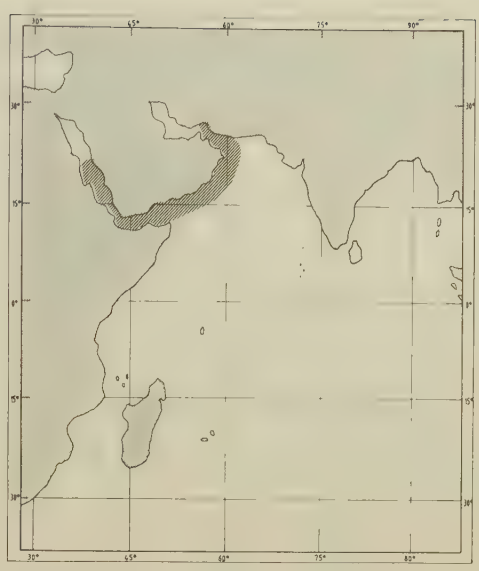
Habitat and Biology : Inhabits coral reefs at depths between about 10 and 20 m. Occurs solitarily or in small groups.

Size : Maximum total length about 35 cm; common to 20 cm.

Interest to Fisheries : Regularly found in fish markets along the Arabian coast, but in small numbers. An important part of the subsistence fishery caught mainly with handlines, traps and gill nets; occasionally trawled. Marketed mostly fresh.

Local Names : -

Literature : Randall (1983); Fischer & Bianchi (eds) (1984); Allen & Talbot (1985).



Lutjanus colorado Jordan & Gilbert, 1882

LUT Lut 50

Lutjanus colorado Jordan & Gilbert, 1882, Proc.U.S.Nat.Mus., 1881:338, 351, 355 (Mazatlán, Mexico).

Synonyms : None.

FAO Names : En - Colorado snapper; Fr - Vivaneau amarante; Sp - Pargo rojo.

See Plate VIII, 29

Diagnostic Features : Preopercular notch and knob weak; vomerine tooth patch crescentic, without a medial posterior extension; tongue with one or more patches of granular teeth; gill rakers on lower limb of first arch (including rudiments) 11 or 12. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 (occasionally 7) soft rays; posterior profile of dorsal and anal fins angular; pectoral fins with 16 or 17 rays; caudal fin truncate. Colour: body and fins mostly red; sometimes a blue streak under eye. Young specimens are barred.

Geographical Distribution : Eastern Pacific Ocean from southern California to Panama. Rare north of Baja California.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 90 cm.

Interest to Fisheries : Caught throughout its range with nets, trawls, and handlines. A common foodfish marketed either fresh or frozen.

Local Names : COSTA RICA: Pargo, Pargo colorado, Pargo rojo, Rojo; EL SALVADOR: Pargueta; GUATEMALA: Huachinango, Pargo; MEXICO: Huachinango, Pargo colorado, Pargo lunarejo.

Literature : Jordan & Evermann (1896).

Remarks : There are unsubstantiated reports of this species from localities as far south as northern Peru.

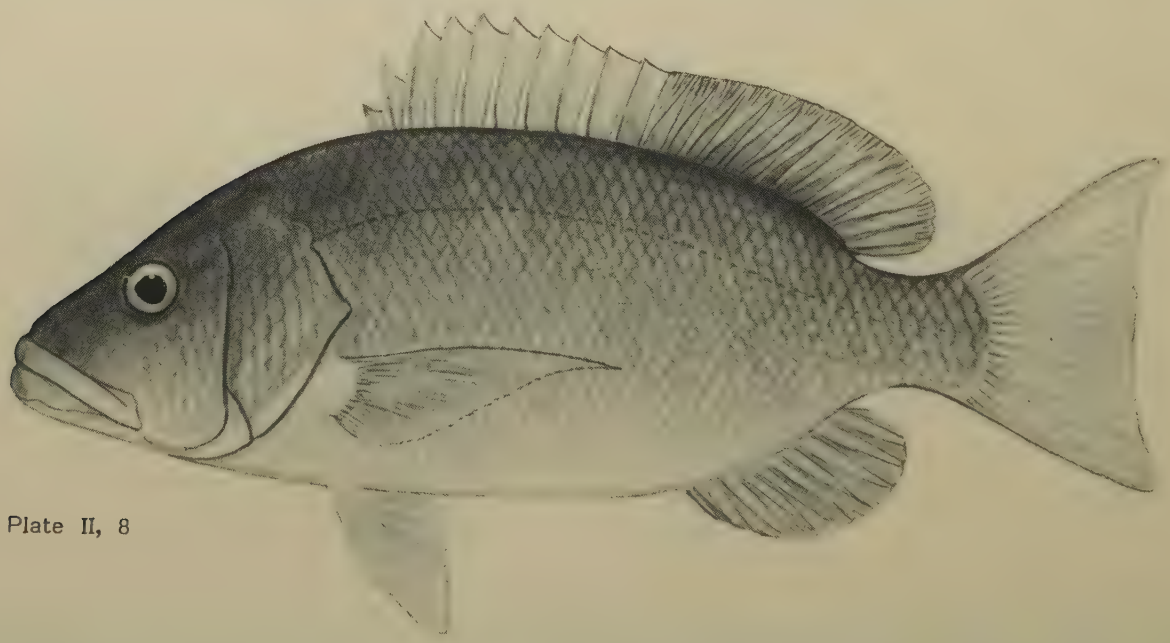
Lutjanus cyanopterus (Cuvier, 1828)

LUT Lut 17

Mesoprion cyanopterus Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:472 (Brazil).

Synonyms : Mesoprion pargus Cuvier (in C. & V., 1828); Lutjanus cubera Poey (1871); Lutjanus cynodon Poey (1868).

FAO Names : En - Cubera snapper; Fr - Vivaneau cubéra; Sp - Pargo cubera.



See Plate II, 8

Diagnostic Features : Body relatively elongate and slender. Mouth with thick lips; preopercular notch and knob weak; canine teeth in both jaws very strong and equally developed; vomerine tooth patch crescentic to triangular, without a medial posterior extension. Dorsal fin with 10 spines and 14 soft rays; anal fin rounded, with 3 spines and 7 or 8 soft rays; pectoral fins short, not reaching level of anus; with 16 to 18 rays; caudal fin nearly truncate. Scale rows on back rising obliquely above lateral line. Colour: back and sides pale to dark grey, with a reddish tinge; dorsal and caudal fins greyish; anal and pelvic fins reddish and pectoral fins translucent or greyish.

Geographical Distribution : Tropical western Atlantic Ocean, northward to the eastern USA and southward to Brazil. Rare north of Florida and apparently rare in the Gulf of Mexico.

Habitat and Biology : Adults found mainly around ledges over rocky bottoms or around reefs at depths to about 40 m. Young sometimes inhabit mangrove areas. Feeds mainly on fishes, shrimps and crabs.

Size : Maximum total length about 160 cm total length; common to 90 cm.

Interest to Fisheries : A good quality food fish of large size. Caught mainly on hook-and-line and with bottom longlines; also with gill nets and bottom trawls, and occasionally speared by divers.

Local Names : CUBA: Cubera; PUERTO RICO: Guasinuco; VENEZUELA: Pargo caballo.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Fischer (ed.) (1978).

Remarks : Sometimes implicated in cases of ciguatera fish poisoning.

Lutjanus decussatus (Cuvier, 1828)

LUT Lut 51

Mesoprion decussatus Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:487 (Java).

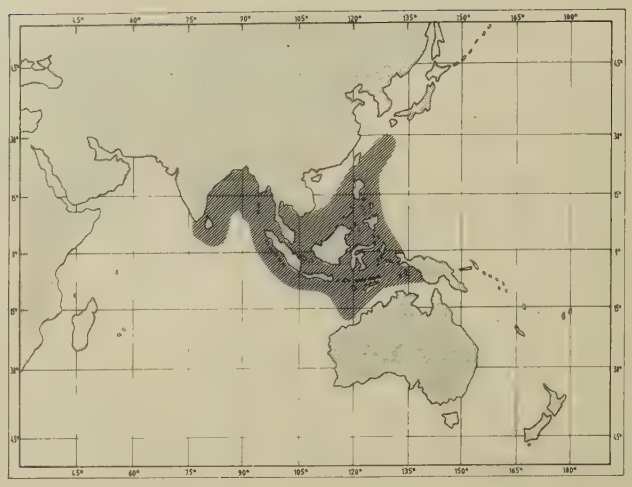
Synonyms : Mesoprion therapon Day (1869).

FAO Names : En - Checkered snapper; Fr - Vivaneau damier; Sp - Pargo ajedrezado.

See Plate XIII, 52

Diagnostic Features : Body moderately deep (greatest depth 2.6 to 3.1 times in standard length). Dorsal profile of head moderately sloped; preorbital bone usually about equal to eye diameter or slightly narrower; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 8 to 10, total rakers on first arch 14 to 16. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 or 9 rays; posterior profile of dorsal and anal fins rounded; with 16 or 17 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: generally whitish with a "checker-board" pattern (see colour illustration) on upper half of sides, consisting of dark brown bars and stripes surrounding rectangular, whitish "windows"; lower half of sides with 2 dark brown stripes; a large black spot covering most of caudal fin base.

Geographical Distribution : Western Pacific and eastern Indian Ocean from New Guinea to Sri Lanka and southern India and northward to the Ryukyu Islands.



Habitat and Biology : Inhabits coral reefs usually at depths between about 5 and 30 m. Occurs both solitarily and in schools.

Size : Maximum total length about 30 cm; common to 20 cm.

Interest to Fisheries : A small snapper of little importance to commercial fisheries, regularly seen in markets and caught by subsistence fishermen, mainly with handlines, traps, and gill nets. Marketed mostly fresh.

Local Names : JAPAN: Amime-fuedai; THAILAND: Pla kapong dang; THE PHILIPPINES: Bala-bala, Buegsang, Dolesan, Tambangao.

Literature : Gloerfelt-Tarp & Kailola (1984); Shen (1984); Masuda et al. (1984); Allen & Talbot (1985).

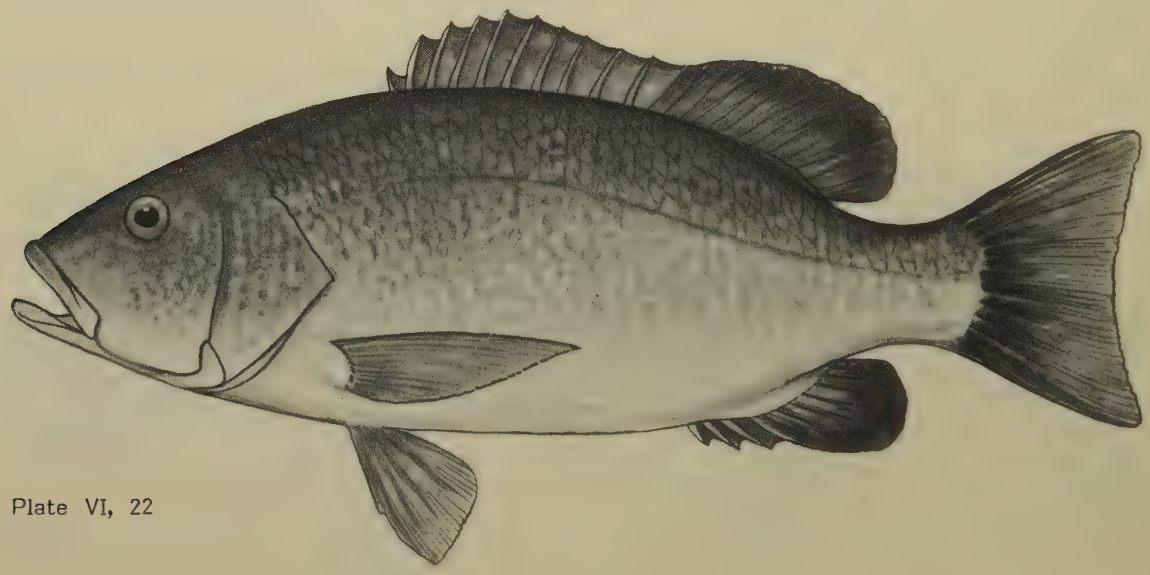
Lutjanus dentatus (Duméril, 1860)

LUT Lut 25

Mesoprion dentatus Duméril, 1860, Arch.Mus.Hist.Nat., 10:245 (Gorée).

Synonyms : Lutjanus eutactus Bleeker (1863).

FAO Names : En - African brown snapper; Fr - Vivaneau brun (d'Afrique); Sp - Pargo marrón africano.



See Plate VI, 22

Diagnostic Features : Body relatively deep. Head slightly rounded, its dorsal profile curving gently; preorbital bone broad; lips thick; maxilla extending to about mid-eye level or beyond; preopercular notch and knob weak; vomerine tooth patch V-shaped in juveniles, but triangular, often with a short posterior extension in adults; gill rakers on lower limb of first arch (including rudiments) 10 or 11. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins of adults not reaching level of anus with 17 rays; caudal fin emarginate. Scales moderate-sized, about 46 to 48 in lateral line; scale rows on back rising obliquely above lateral line; scales between lateral line and base of dorsal fin (at middle of spinous portion) $4\frac{1}{2}$ or 5; scale rows on cheek 9 or 10. Colour: back and upper sides smoke-grey; whitish to pink on lower sides and belly; juveniles with a series of alternating light and dark bars of about equal widths on side.

Geographical Distribution : West African coast, primarily in the Gulf of Guinea.

Habitat and Biology : Occurs on rocky bottoms and coral reefs; also common in brackish lagoons and sometimes in rivers. Feeds on fishes and crustaceans.

Size : Maximum total length about 70 cm, possibly larger; common to 50 cm.

Interest to Fisheries : Important in local subsistence fisheries. Caught with handlines and fixed bottom nets.

Local Names : GUINEA: Bammaroni, Kinsidini, Woli; IVORY COAST: Edion-san; Késan-gba; SENEGAL: Warale, Yakh.

Literature : Fowler (1936); Delais (1952); Boeseman (1963); Bauchot & Daget (1967); Fischer, Bianchi & Scott (eds) (1981).

Remarks : Mesoprion retrospinis Valenciennes (in C. & V., 1830:541) may be the oldest name for this species as the original description agrees closely to that given by Delais (1952). The type is lost.

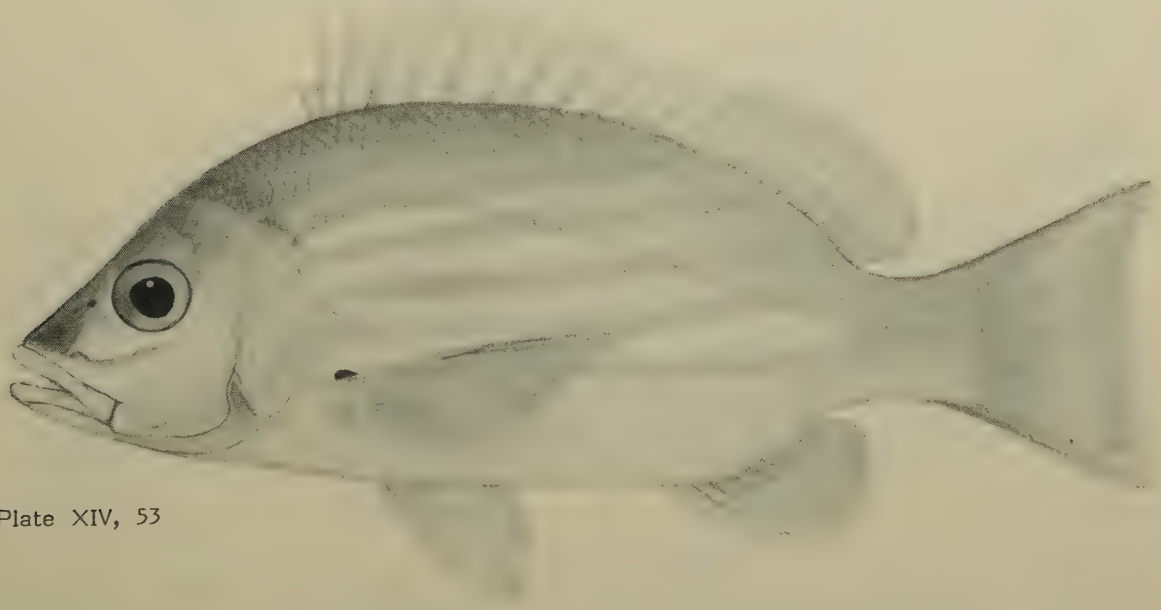
Lutjanus dodecacanthoides (Bleeker, 1854b)

LUT Lut 52

Mesoprion dodecacanthoides Bleeker, 1854a, Nat.Tijds.Nederland.Indië, 6:489 (Amboina).

Synonyms : None.

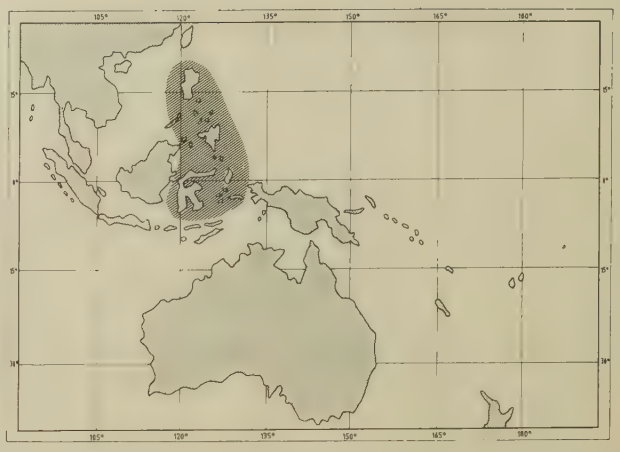
FAO Names : En - Sunbeam snapper; Fr - Vivaneau soleil; Sp - Pargo solrayo.



See Plate XIV, 53

Diagnostic Features : Body moderately deep (greatest depth 2.5 to 2.7 times in standard length). Dorsal profile of head steeply sloped; eye relatively large; preorbital bone slightly narrower than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth without teeth; gill rakers on lower limb of first arch 15, total rakers on first arch 22. Dorsal fin with 10 spines and 12 or 13 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 17 rays; caudal fin slightly emarginate or truncate. Scale rows on back rising obliquely above lateral line. Colour: back brownish; sides slightly pink with silver sheen, grading to white on belly and underside of head; series of 6 orange horizontal stripes on sides, the 4 uppermost slanted posteriorly toward dorsal fin base; brown to golden spot at base of uppermost pectoral rays, sometimes invading axil.

Geographical Distribution : Known only from Indonesia and the Philippines.



Habitat and Biology : Inhabits coral reefs, presumably in shallow water (less than about 30 m).

Size : Maximum total length about 30 cm.

Interest to Fisheries : A rare species, appearing infrequently in markets. Caught mainly with handlines, traps and gill nets.

Local Names : JAPAN: Kisuji-tarumi.

Literature : Masuda et al. (1984, as L. rufolineatus); Allen & Talbot (1985).

Lutjanus ehrenbergii (Peters, 1869)

LUT Lut 34

Lutianus ehrenbergii Peters, 1869, Monatsb.Akad.Wiss.Berlin:704 (Red Sea).

Synonyms : Lutjanus oligolepis Bleeker (1873).

FAO Names : En - Blackspot snapper; Fr - Vivaneau encrier; Sp - Pargo manchado.

See Plate XIV, 54

Diagnostic Features : Body moderately deep to somewhat slender (greatest depth 2.5 to 3.0 times in standard length). Dorsal profile of head moderately sloped; preorbital bone very narrow, its width about half of eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 14 or 15, total rakers on first arch 16 to 21. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins angular or somewhat rounded; pectoral fins with 15 or 16 rays; caudal fin truncate or slightly emarginate. Scale rows on back parallel to lateral line. Colour: back and upper sides dark brown; lower sides and belly whitish with a silver sheen; often a series of 4 or 5 narrow yellow stripes on sides below lateral line; a prominent round, black spot on back below posterior part of spinous portion of dorsal fin.

Geographical Distribution : Widespread in the Indo-West Pacific from the Solomon and Mariana Islands to East Africa.

Habitat and Biology : Inhabits coral reefs at depths between about 5 and 20 m. Juveniles frequent inshore areas over sand, silt, or coral rubble bottoms, occasionally in mangrove-lined streams and estuaries.

Size : Maximum total length of about 35 cm; common to 20 cm. Matures at about 12 cm.

Interest to Fisheries : A small species, commonly utilized in subsistence fisheries and also seen in markets. Caught mainly with handlines, traps and gill nets. Marketed mostly fresh.

Local Names : KENYA: Tembo; SEYCHELLES: Ziebelo; SOUTH AFRICA: Swartkol-snapper, Blackspot snapper; TANZANIA: Janja.

Literature : Randall (1983); Allen & Talbot (1985).

Lutjanus endecacanthus Bleeker, 1863

LUT Lut 26

Lutjanus endecacanthus Bleeker, 1863, Natuurk.Verh.Holland.Maatsch.Wet., Haarlem, 18(2):48 (Ashantee, Guinea).

Synonyms : None.

FAO Names : En - Guinea snapper; Fr - Vivaneau de Guinée; Sp - Pargo de Guinea.

See Plate VI, 23

Diagnostic Features : Body moderately deep. Head pointed, dorsal profile of forehead somewhat angular; preorbital bone broad; maxilla extending to level of front part of eye; preopercular notch and knob weak; vomerine tooth patch triangular, occasionally with a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 12, total rakers on first arch 20 (all but 7 or 8 are low rudiments). Dorsal fin with 10 spines (rarely 11) and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins long, reaching level of anus, with 17 rays; caudal fin truncate. Scales moderate-sized, about 46 to 48 in lateral line; scale rows on back rising obliquely above lateral line; scales between lateral line and base of dorsal fin (at middle of spinous portion) 6; scale rows on cheek 8 to 10. Colour: back and upper sides brown to dark brown; brown on lower sides and silvery white on belly; dorsal, anal, caudal, and pelvic fins mainly dark brown; juveniles frequently with 6 to 8 vertical rows of white spots on sides and a pair of blue lines on cheek below eye; specimens under about 15 cm standard length with dusky patch, margined with white anteriorly and posteriorly on upper edge of caudal peduncle behind base of last dorsal ray.

Geographical Distribution : West African coast from Ghana to the Congo River mouth.

Habitat and Biology : Occurs on rocky bottoms and coral reefs; also found in brackish lagoons and sometimes in rivers.

Size : Largest known specimen about 20 cm total length, but probably attains a larger size.

Interest to Fisheries : Important in local subsistence fisheries. Caught with handlines and fixed bottom nets. Marketed mainly fresh.

Local Names : GUINEA: Kèskès, Nikini; IVORY COAST: Edion-san, Késan-gba

Literature : Fowler (1936); Bauchot & Daget (1967); Fischer, Bianchi & Scott (eds) (1981).

Lutjanus erythropterus Bloch, 1790

LUT Lut 8

Lutjanus erythropterus Bloch, 1790, Naturg.Ausländ.Fische., 4:115 (Japan).

Synonyms : Mesoprion rubellus Cuvier (in C. & V., 1828); Mesoprion annularis Cuvier (in C. & V., 1828); Mesoprion chirtah Cuvier (in C. & V., 1828); Genyoroge macleayana Ramsay (1883); Lutjanus longmani Whitley (1937); Lutjanus altifrontalis Chan (1970).

FAO Names : En - Crimson snapper; Fr - Vivaneau cramoisi; Sp - Pargo carmesí.

See Plate XIV, 55

juvenile

See Plate XIV, 55a

Diagnostic Features : Body moderately deep (greatest depth 2.5 to 3.0 times in standard length). Dorsal profile of head sloped; mouth relatively small, length of upper jaw smaller than distance between base of last dorsal and anal rays; pre-orbital bone usually narrower than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic or triangular, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 13 or 14, total rakers on first arch 18 or 19. Dorsal fin with 10 spines and 12 to 14 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: overall pink or red, including fins; juveniles with a broad, oblique, black band extending from mouth to beginning of dorsal fin and a large black spot at base of caudal fin; frequently with narrow red stripes.

Geographical Distribution : Widespread in the Indo-West Pacific from Australia and New Guinea to the Gulf of Oman, and northward to southern Japan.

Habitat and Biology : Inhabits trawling grounds and reefs to depths of at least 100 m.

Size : Maximum total length about 60 cm; common to 45 cm.

Interest to Fisheries : An excellent foodfish, appearing regularly in markets, but usually in small quantities. Caught mainly with handlines and bottom trawls. Marketed fresh or dried-salted.

Local Names : AUSTRALIA: Saddle-tailed sea-perch; TANZANIA: Changu; THE PHILIPPINES: Ahaan, Dapak, Pulakau.

Literature : Fischer & Bianchi (eds) (1984); Shen (1984, in part as Pinjalo pinjalo); Allen & Talbot (1985).

Remarks : This species has been referred to as Lutjanus malabaricus (non Schneider) or L. altifrontalis by many recent authors.

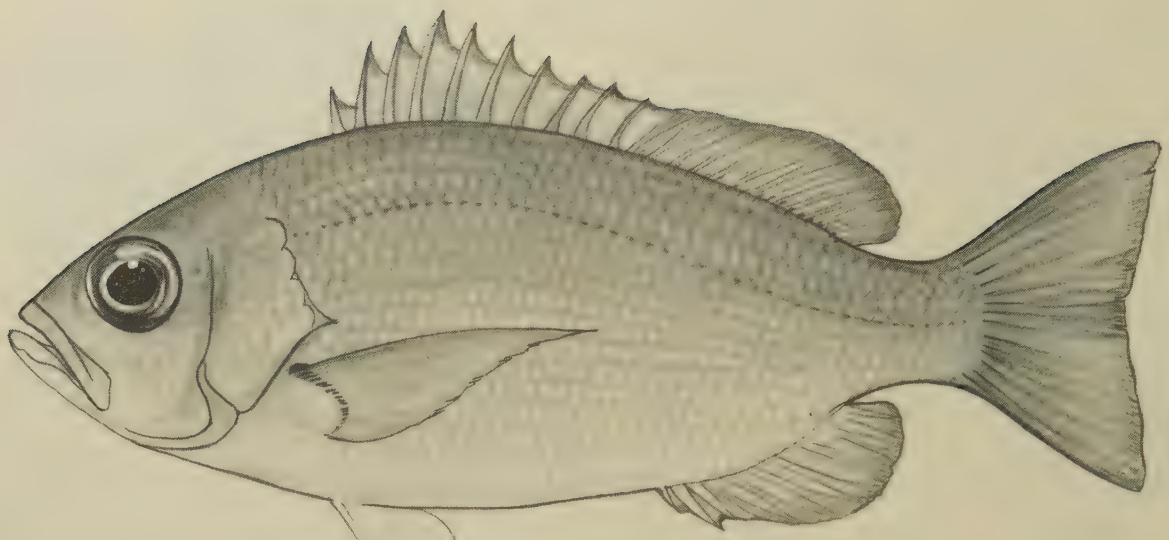
Lutjanus fulgens (Valenciennes, 1830)

LUT Lut 27

Mesoprion fulgens Valenciennes (in C. & V.), 1830, Hist.Nat.Poiss., 6:406 (Gorée).

Synonyms : Lutjanus maltzani Steindachner (1882).

FAO Names : En - Golden African snapper; Fr - Vivaneau doré; Sp - Pargo dorado africano.



See Plate VI, 24

Diagnostic Features : Body moderately slender. Head blunt, snout short, much shorter than eye diameter; eye very large; preorbital bone narrow, its width less than half the eye diameter; maxilla extending to about mid-eye level; preopercular notch and knob weak; vomerine tooth patch triangular, with a pronounced median posterior extension. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins short, not reaching level of anus; caudal fin emarginate. Scales moderate-sized, about 43 to 46 in lateral line; scale rows on back parallel to lateral line; scales between lateral line and base of dorsal fin (at middle of spinous portion) $4\frac{1}{2}$ to 5; scale rows on cheek 5. Colour: back and sides vivid pink; silvery white on lower sides and belly; sides with horizontal golden bands, one per scale row.

Geographical Distribution : West African coast, primarily between Nigeria and Senegal, and in the Gulf of Guinea; also at the Cape Verde Islands.

Habitat and Biology : Occurs on rocky bottoms to at least 60 m depth; also found in deeper offshore waters. Feeds on fishes and crustaceans.

Size : Maximum total length about 60 cm; common to 50 cm.

Interest to Fisheries : Important in local subsistence fisheries. Most common from May to October off Senegal. Caught with handlines and trawl nets.

Local Names : IVORY COAST: Edion-si, Késan, Kpéna; SENEGAL: Madam Simèr, Mame Simèr; TOGO: Haha.

Literature : Delais (1952); Bauchot & Daget (1967); Fischer, Bianchi & Scott (eds) (1981).

Lutjanus fulviflamma (Forsskål, 1775)

LUT Lut 3

Sciaena fulviflamma Forsskål, 1775, Descript.Animal.:xi, 45 (Arabia).

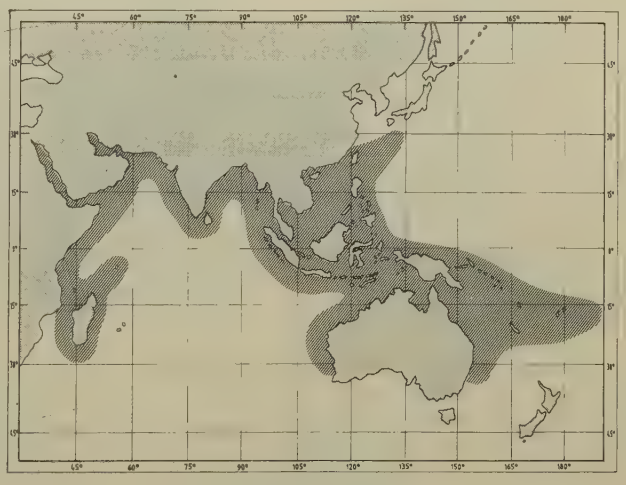
Synonyms : Centropomus hober Lacepède (1803); Lutjanus unimaculatus Quoy & Gaimard (1824); Mesoprion auro-lineatus Cuvier (in C. & V., 1830); Mesoprion terubuan Thiollière (in Montrouzier, 1856); Mesoprion aureovittatus Macleay (1879).

FAO Names : En - Blackspot snapper; Fr - Vivaneau gibelot; Sp - Pargo tintero.

See Plate XIV, 56

Diagnostic Features : Body moderately deep to somewhat slender (greatest depth 2.6 to 2.9 times in standard length). Dorsal profile of head moderately sloped; preorbital bone about equal in width to eye diameter or slightly less; preopercular notch and kob poorly developed; vomerine tooth patch triangular, with a medial posterior extension or diamond-shaped; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 9 to 12, total rakers on first arch 16 to 19. Dorsal fin with 10 spines and 12 to 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded to somewhat angular; pectoral fins with 15 to 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides brown; lower sides whitish or light brown; whitish to yellow on belly; a series of 6 or 7 yellow stripes on sides; a prominent black spot at level of lateral line below base of anterior part of soft portion of dorsal fin; fins yellowish.

Geographical Distribution : Widespread in the Indo-Pacific from Samoa to East Africa, and from Australia northward to the Ryukyu Islands.



Habitat and Biology : Inhabits coral reefs at depths between about 3 and 35 m. Juveniles sometimes found in brackish water of mangrove estuaries or in the lower reaches of freshwater streams. Feeds mainly on fishes, shrimps, crabs and other crustaceans. At New Caledonia and East Africa spawning occurs mainly from August to March (spring and summer).

Size : Maximum total length about 35 cm; common to 25 cm. Matures at about 20 to 25 cm.

Interest to Fisheries : A small species, commonly utilized in subsistence fisheries and also seen frequently in markets, usually fresh. Caught mainly with handlines, traps and gill nets.

Local Names : JAPAN: Nise kurohoshi-fuedai; KUWAIT: Naisarah; LACCADIVE ISLANDS: Chutton, Chuttommetti, Luggambanda; MADAGASCAR: Amparana, Bobotsy, Fiambato, Fiamasiaka, Varavarana; NEW CALEDONIA: Dorade à tache noire; SAUDI ARABIA: Hobara, Naisara; SEYCHELLES: Carpe; SOUTH AFRICA: Dorie-snapper, Dory snapper; TANZANIA: Janja, Kelea, Tembo; THAILAND: Pla kapong; THE PHILIPPINES: Bahaba, Bitilla, Darag-darag, Islawan, Matangal, Silay.

Literature : Randall (1983); Fischer & Bianchi (eds) (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

Lutjanus fulvus (Schneider, 1801)

LUT Lut 35

Holocentrus fulvus Schneider (in Bloch & Schneider), 1801, Syst.Ichth.:318 (Tahiti).

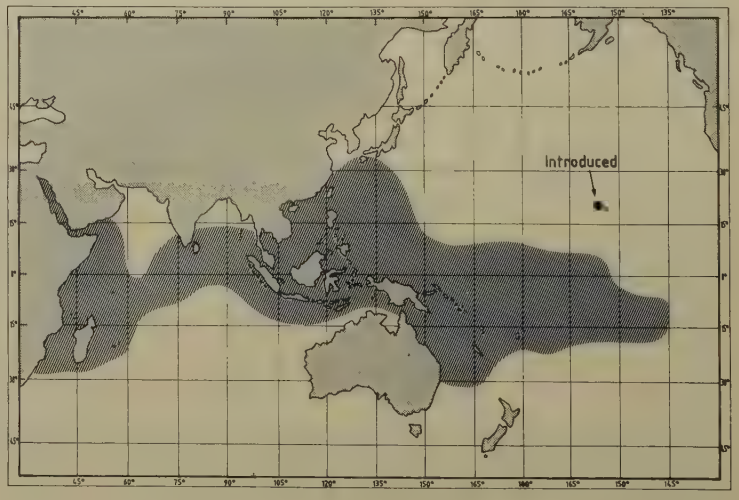
Synonyms : Diacope vaigiensis Quoy & Gaimard (1824); Diacope marginata Cuvier (in C. & V., 1828); Diacope immaculata Cuvier (in C. & V., 1828); Diacope xanthopus Cuvier (in C. & V., 1829); Diacope flavipes Valenciennes (in C. & V., 1830); Diacope analis Valenciennes (in C. & V., 1830); Diacope aurantiaca Valenciennes (in C. & V., 1830); Mesoprion argenteus Hombron & Jacquinot (in Jacquinot & Guichenot, 1853); Mesoprion maus Thiollière (in Montrouzier, 1856); Mesoprion gaimardi Bleeker (1859); Mesoprion kagoshima Steindachner & Doederlein (1883); Mesoprion marginipinnis Macleay (1883); Genyoroge nigricauda De Vis (1885a); Lutjanus marginatoides Kendall & Goldsborough (1911).

FAO Names : En - Blacktail snapper; Fr - Vivaneau queue noire; Sp - Pargo rabo negro.

See Plate XV, 57

Diagnostic Features : Dorsal profile of head steeply sloped; preorbital bone about equal in width to eye diameter; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 10 to 13, total rakers on first arch 16 to 20. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 rays; caudal fin slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and sides grey to brown; often with a series of narrow yellow or golden-brown stripes, one per scale rows, on sides; belly and underside of head whitish; dorsal fin brown to reddish, with a narrow blackish band near margin, broader on soft part of dorsal; caudal fin blackish, dorsal and caudal fins with a narrow white border; pelvic and anal fins yellowish.

Geographical Distribution : Widespread in the Indo-Pacific from the Marquesas and Line Islands to East Africa, and from Australia to southern Japan. Introduced to the Hawaiian Islands.



Habitat and Biology : Inhabits coral reefs in lagoons and on outer reef slopes in about 2 to 40 m depth. Juveniles sometimes found in shallow mangrove swamps and the lower parts of freshwater streams. Feeds at night on fishes, shrimps, crabs, holothurians and cephalopods. Spawning occurs throughout the year, at least in lower latitudes.

Size : Maximum total length about 40 cm; common to 25 cm. Matures at about 20 to 30 cm.

Interest to Fisheries : Commonly seen in markets, usually fresh. Caught with handlines, traps and gill nets. Sometimes causes ciguatera poisoning, particularly in the Pacific portion of its range.

Local Names : AUSTRALIA: Yellow-margined sea-perch; ELLICE ISLANDS: Te tangau; GILBERT ISLANDS: Te bave; GUAM: Kakaka; JAPAN: Oki-fuedai; NEW CALEDONIA: Lutjan fauve; PALAU: Kesebii, Reyall; SAMOA: Tamala; SOUTH AFRICA: Geelstreep-snapper, Yellow-striped snapper; SRI LANKA: Padalla (S); TAHITI: To'au; TANZANIA: Changu; THAILAND: Pla kapong dang; THE PHILIPPINES: Agawin, Bambangin, Dapak, Pargo, Tingarog; TUAMOTUS (Raroia): Magu magu.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

Remarks : Has frequently been referred to as Lutjanus vaigiensis and L. marginatus by recent authors.

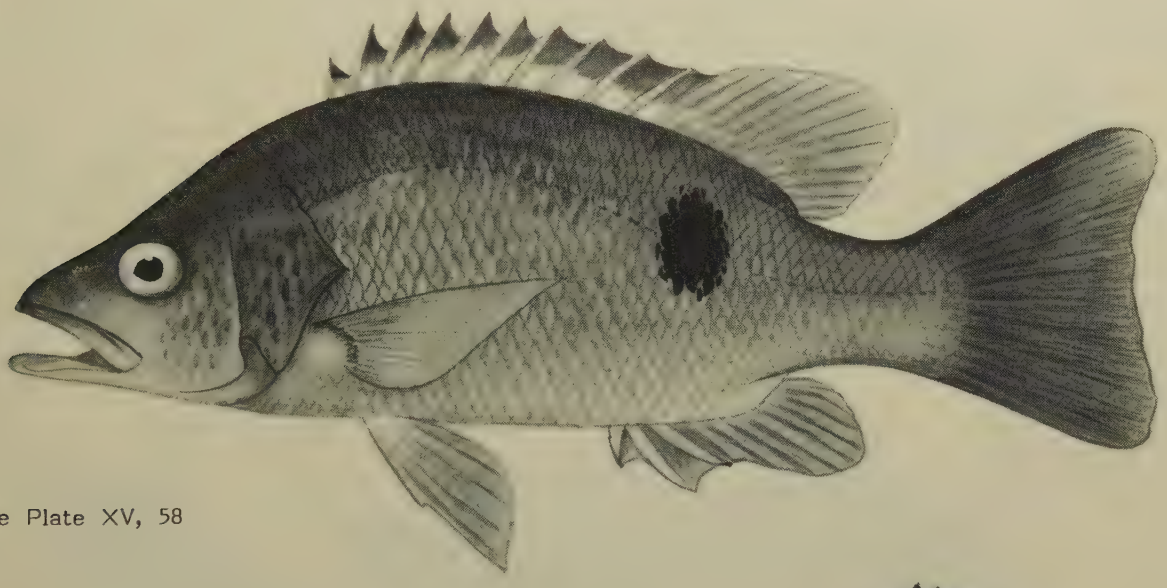
Lutjanus fuscescens (Valenciennes, 1830)

LUT Lut 53

Mesoprion fuscescens Valenciennes, (in C. & V.), 1830, Hist.Nat.Poiss., 6:538 (freshwaters of Celebes).

Synonyms : Mesoprion hoteen Richardson (1846).

FAO Names : En - Freshwater snapper; Fr - Vivaneau d'eau douce; Sp - Pargo de agua dulce.



See Plate XV, 58

Diagnostic Features : Dorsal profile of head moderately sloped; preorbital width about equal to, or slightly narrower than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 12, total gill rakers on first arch 18. Dorsal fin with 10 spines and 13 to 15 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising parallel to lateral line. Colour: back and sides greyish-brown or olive, whitish on belly; a prominent black spot on back, bisected by lateral line, below anterior soft dorsal rays; juveniles with a series of diffuse blackish bars on sides.

juvenile

See Plate XV, 58a

Geographical Distribution : Known only from the Solomon Islands, New Guinea, Indonesia, the Philippines and China.

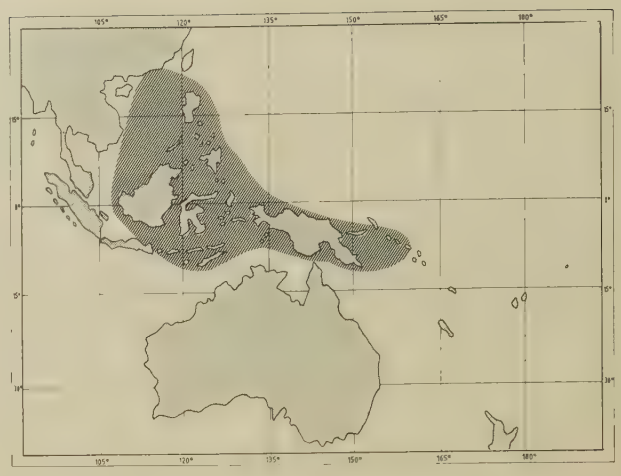
Habitat and Biology : Inhabits freshwater streams and brackish, mangrove-lined estuaries. Not reported from purely marine habitats.

Size : Maximum total length about 40 cm.

Interest to Fisheries : Apparently rare and of little interest to fisheries.

Local Names : THE PHILIPPINES: Kamang buhu.

Literature : Allen & Talbot (1985).



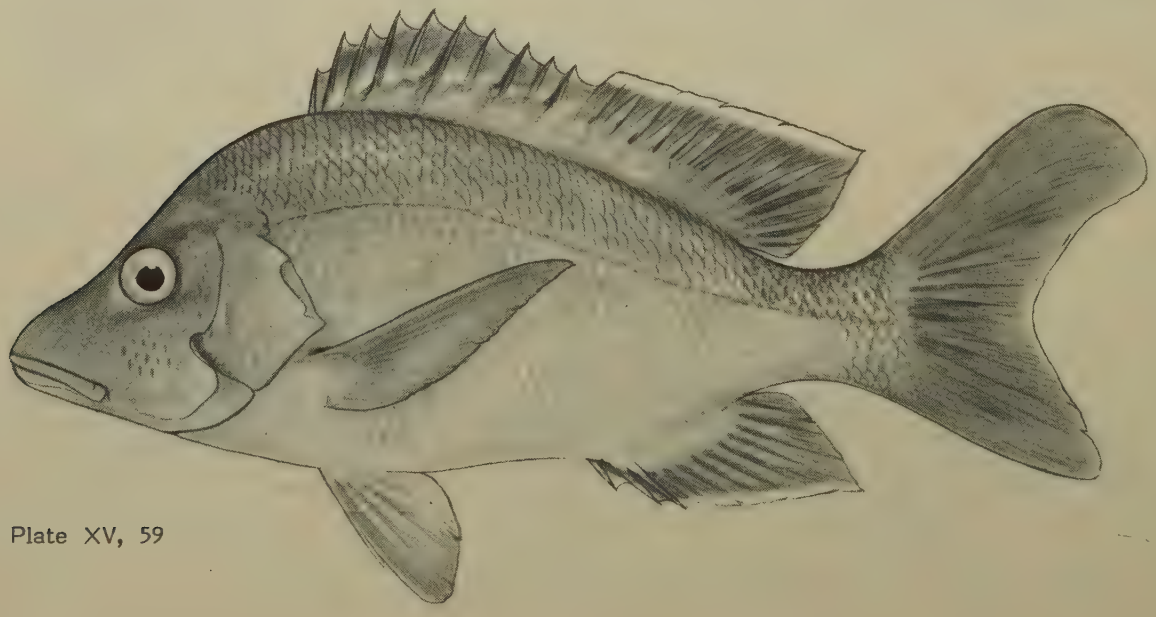
Lutjanus gibbus (Forsskål, 1775)

LUT Lut 4

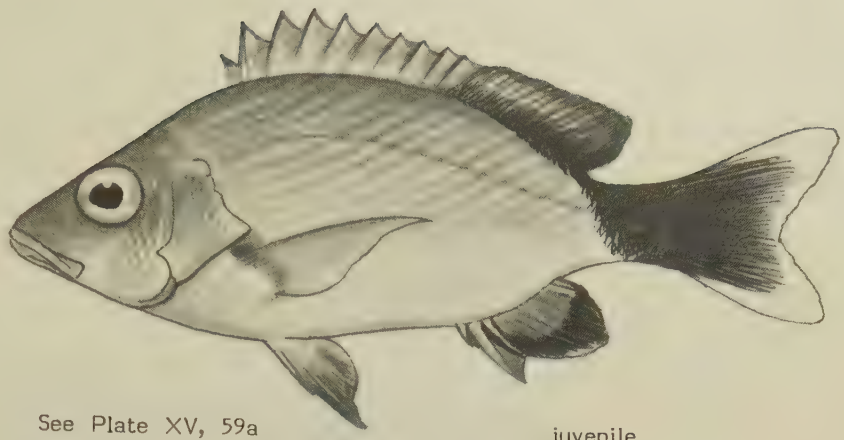
Sciaena gibba Forsskål, 1775, Descript.Animal.:ix, 46 (Arabia).

Synonyms : Diacope lineata Quoy & Gaimard (1824); Diacope striata Cuvier (in C. & V., 1828); Diacope borensis Cuvier (in C. & V., 1828); Diacope coccinea Cuvier (in C. & V., 1828); Diacope axillaris Valenciennes (in C. & V., 1830); Diacope rosea Valenciennes (in C. & V., 1830); Diacope tiea Lesson (1830); Diacope melanura Rüppell (1838); Mesoprion janthinurus Bleeker (1854); Genyoroge bidens Macleay (1883); Lutianus tahitiensis Seale (1906); Lutjanus comoriensis Fourmanoir (1957).

FAO Names : En - Humpback red snapper; Fr - Vivaneau pagaie; Sp - Pargo jorobado.



See Plate XV, 59

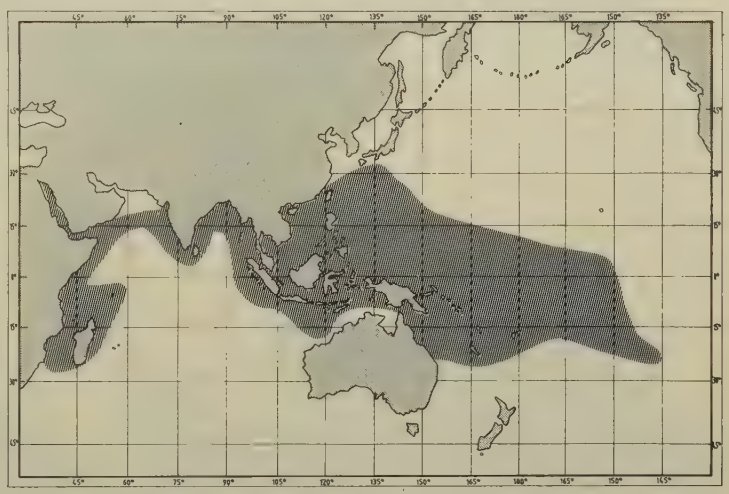


See Plate XV, 59a

juvenile

Diagnostic Features : Body relatively deep (greatest depth 2.2 to 2.5 times in standard length). Dorsal profile of head steeply sloped; preorbital bone broad, much wider than eye diameter; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 15 to 20, total rakers on first arch 25 to 30. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins pointed; pectoral fins with 16 or 17 rays; caudal fin distinctly forked with rounded lobes. Scale rows on back rising obliquely both, above and below the lateral line. Colour: red or grey, darker on back and upper portion of head; an orange hue on lower part of opercle and in pectoral fin axil; fins red or frequently dark brown to blackish; soft part of dorsal fin, anal and caudal fins with a narrow white margin; juveniles with a large round, black spot at base of caudal fin.

Geographical Distribution : Widespread in the Indo-West Pacific from the Society and Line Islands to East Africa, and Australia to southern Japan.



Habitat and Biology : Mainly inhabits coral reefs, sometimes forming large aggregations, which are mostly stationary during daylight hours. Normal depth distribution ranges from about 6 to at least 30 m. Feeds on fishes and a variety of invertebrates including shrimps, crabs, lobsters, stomatopods, cephalopods, echinoderms, and ophiuroids. Off East Africa spawning occurs mainly during spring and summer.

Size : Maximum total length about 50 cm; common to 35 cm. Matures at about 30 cm.

Interest to Fisheries : Caught mainly with handlines, traps and gill nets. Commonly seen in markets, usually offered fresh. Sometimes causes ciguatera poisoning, particularly around the Pacific Islands.

Local Names : AUSTRALIA: Paddle-tail; ELLICE ISLANDS: Te taaea; GILBERT ISLANDS: Te ikanibong; JAPAN: Hime-fuedai; NEW CALEDONIA: Queue en pagaie; PALAU: Keremlal; SAMOA: Mala'i; SAUDI ARABIA: Asmoodi; SOUTH AFRICA: Boggel-snapper, Humpback snapper; TAHITI: Tuhara; TANZANIA: Haraki; THE PHILIPPINES: Agba-on, Ahaan, Bambangon, Dapak, Maya-maya; TUAMOTUS (Raroia): Puaki (small), Tero (medium), Parai (large).

Literature : Kyushin et al. (1977); Randall (1983); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

Lutjanus goldiei (Macleay, 1882)

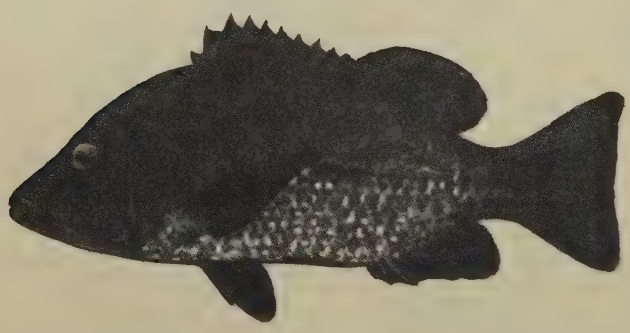
LUT Lut 54

Mesoprion goldiei Macleay, 1882, Proc.Linn.Soc.New South Wales, 7:233 (New Guinea).

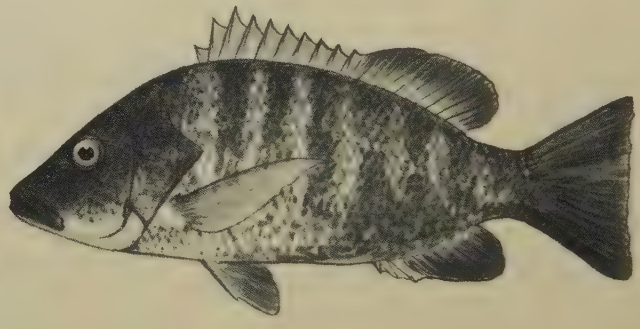
Synonyms : None.

FAO Names : En - Papuan black snapper; Fr - Vivaneau de Papua; Sp - Pargo de Papua.

See Plate XVI, 60



See Plate XVI, 60b black variety



See Plate XVI, 60a barred variety

Diagnostic Features : Body relatively deep (greatest depth 2.2 to 2.8 times in standard length). Dorsal profile of head steeply sloped; preorbital bone relatively broad, usually much greater than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 9, total rakers on first arch 14 or 15. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin truncate. Scale rows on back parallel to lateral line anteriorly. Colour: back and upper sides dark brown to charcoal-grey, lower sides and belly golden-brown to whitish; there are also distinct colour phases with the entire body blackish or with a series of 6 or 7 broad greyish bars on sides; fins dusky brown to blackish, sometimes with a yellow hue.

Geographical Distribution : Known only from southern Papua New Guinea between the Port Moresby district and the Fly River.

Habitat and Biology : Inhabits large freshwater streams. Not reliably reported from marine habitats but may occur in brackish estuaries.

Size : Maximum total length about 100 cm; common to 60 cm.

Interest to Fisheries : Occasionally seen in the fish market at Port Moresby. A popular sport fish forming the basis of a safari-angling industry. Caught mainly with handlines, rod and reel, traps and gill nets; also with spears.

Local Names : PAPUA NEW GUINEA: Papuan black bass.

Literature : Allen & Talbot (1985).

Lutjanus goreensis (Valenciennes, 1830)

LUT Lut 28

Mesoprion goreensis Valenciennes (in C. & V.), 1830, Hist.Nat.Poiss., 6:406 (Gorée).

Synonyms : Lutjanus guineensis Bleeker (1863).

FAO Names : En - Gorean snapper; Fr - Vivaneau de Goré; Sp - Pargo de Gorea.

See Plate VII, 25

Diagnostic Features : Body relatively deep. Head pointed, dorsal profile of forehead steep; preorbital bone broad; maxilla extending to about mid-eye level; vomerine tooth patch triangular, with a pronounced medial posterior extension; gill rakers on lower limb of first arch (including rudiments) about 13, total rakers on first arch about 19. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins of adults not reaching level of anus, with 17 rays; caudal fin slightly emarginate. Scales moderate-sized, about 43

to 46 in lateral line; scale rows on back parallel to lateral line; scales between lateral line and base of dorsal fin (at middle of spinous portion) 5 to 7; scale rows on cheek 5 or 6. Colour: back and upper sides brilliant pink or reddish; lower sides and belly silvery-white; narrow blue band or row of broken spots below eye; small specimens from shallow water mainly brownish.

Geographical Distribution : West African coast, mainly in the Gulf of Guinea between Senegal and the Congo; also at the Cape Verde Islands.

Habitat and Biology : Occurs on rocky bottoms and in the vicinity of coral reefs. The young are frequently encountered in coastal waters, particularly estuaries and sometimes in rivers. A voracious predator feeding mainly on fishes and bottom-dwelling invertebrates.

Size : Maximum total length about 80 cm; common to 50 cm.

Interest to Fisheries : Important in local subsistence fisheries. Caught with handlines, fixed bottom nets, and trawling gear. Marketed mainly fresh.

Local Names : GUINEA: Kèskès, Nikini; IVORY COAST: Edion-si, Késan, Kpéna; SENEGAL: Ndiagatoum; TOGO: Haha.

Literature : Delais (1952); Boeseman (1963); Bauchot & Daget (1967); Fischer, Bianchi & Scott (eds) (1981).

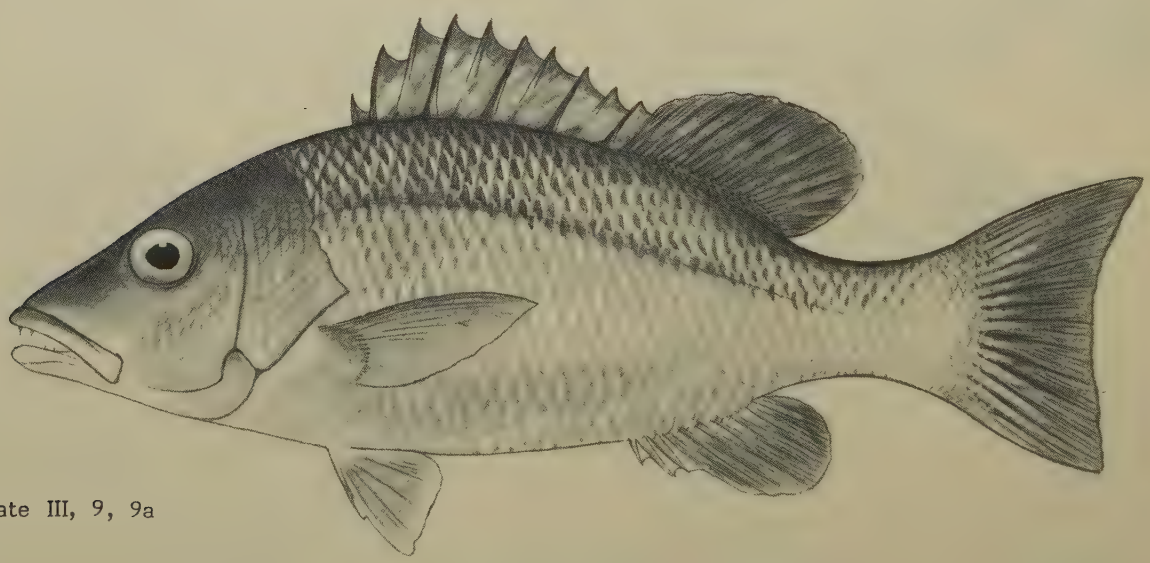
Lutjanus griseus (Linnaeus, 1758)

LUT Lut 18

Labrus griseus Linnaeus, 1758, Syst.Nat., 9:283 (Bahamas).

Synonyms : Sparus tetracanthus Bloch (1791); Anthias caballerote Bloch & Schneider (1801); Bodianus vivanet Lacepède (1803); Lobotes emarginatus Baird & Girard (1855); Lutjanus stearnsi Goode & Bean (1879).

FAO Names : En - Grey snapper; Fr - Vivaneau sarde grise; Sp - Pargo prieto.



See Plate III, 9, 9a

Diagnostic Features : Body relatively slender. Dorsal profile of head slightly concave, snout long and pointed; preopercular notch and knob weak; outer pair of canine teeth in upper jaw much larger than lower canines; vomerine tooth patch V-shaped or crescentic, with a medial posterior extension. Dorsal fin with 10 spines and 14 (rarely 13) soft rays; anal fin rounded, with 3 spines and 7 or 8 soft rays; pectoral fins short, not reaching level of anus, with 16 or 17 (rarely 15) rays; caudal fin emarginate. Scale rows on back parallel to

lateral line anteriorly, but rising obliquely posteriorly, below soft part of dorsal fin. Colour: back and upper sides grey, greenish-grey or dark olive, sometimes with a reddish tinge; lower sides and belly greyish with a reddish tinge; fins greyish or reddish. Young specimens with a dark stripe from snout through eye to upper opercle and a blue stripe on cheek below eye.

Geographical Distribution : Tropical western Atlantic Ocean as far north as Massachusetts and southward to Rio de Janeiro. Rare north of Florida. Common off southeast Florida and around the Antilles.

Habitat and Biology : Inhabits coastal as well as offshore waters to depths of 180 m. Found around coral reefs and in rocky areas, also in estuaries and mangrove areas, sometimes in the lower reaches of rivers (especially the young). Often forms large aggregations. Adults feed mainly at night on small fishes, shrimps, crabs, gastropods, cephalopods and some planktonic items. Spawning occurs during the summer near the time of the full moon. The eggs which mesure 0.70 to 0.85 in diameter, hatch after about 20 hours (27^{o}C). The larvae grow to about 15 mm after 36 days. Postlarval fish enter grass beds at a standard length of about 10 mm. Maturity is attained after about 2 years. The growth rate of tagged fish (256 to 324 mm fork length) averaged 46.5 mm per year. Estimated maximum age: 21 years.

Size : Maximum total length about 89 cm; common to 40 cm. Matures at about 18 to 33 cm.

Interest to Fisheries : Fished commercially, but probably more important as a sport angling fish. The flesh is of excellent quality. Caught mainly with beach seines, boat seines, gill nets and traps; also with angling gear, handlines and speared by divers.

Local Names : COLOMBIA: Pargo manglero, Pargo prieto; CUBA: Caballerote; MARTINIQUE: Sarde grise; MEXICO: Pargo prieto; PUERTO RICO, SANTO DOMINGO: Pargo prieto; VENEZUELA: Pargo dentón.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Starck & Schroeder (1970); Fischer (ed.) (1978).

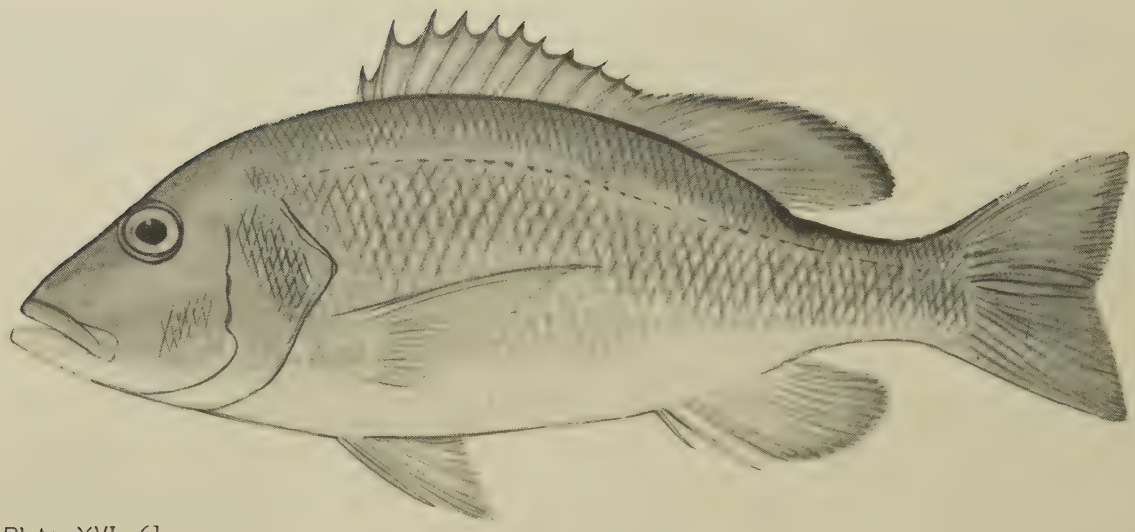
Lutjanus guilcheri Fourmanoir, 1959

LUT Lut 42

Lutjanus guilcheri Fourmanoir, 1959, Nat.Malgache, 10:129 (Madagascar).

Synonyms : None.

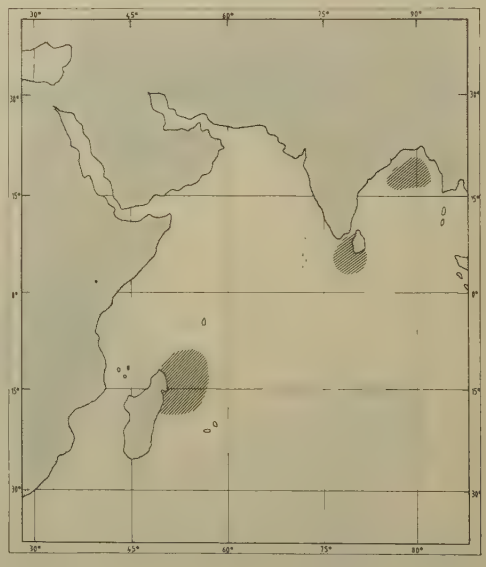
FAO Names : En - Yellowfin red snapper; Fr - Vivaneau queue jaune; Sp - Pargo rabo amarillo.



See Plate XVI, 61

Diagnostic Features : Body moderately deep (greatest depth 2.6 times in standard length). Dorsal profile of head steeply sloped; preorbital bone relatively broad, its width greater than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 14, total rakers on first arch 21. Dorsal fin with 10 or 11 spines and 13 or 14 soft rays; anal fin with 3 spines and 9 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: red or reddish-orange, sometimes with an indistinct saddle-like black blotch on caudal peduncle behind dorsal fin; median fins reddish, sometimes with a yellow suffusion and narrow brown or black borders; pelvic fins red; pectoral fins yellow.

Geographical Distribution : Known only from Madagascar, Sri Lanka, and the Bay of Bengal, but probably widespread in the tropical Indian Ocean.



Habitat and Biology : Occurs over rocky bottoms to at least 70 m depth.

Size : Maximum total length about 60 cm; common to 45 cm.

Interest to Fisheries : Of potential interest to fisheries if additional stocks can be located. Caught with deep handlines and trawls. Commonly seen in markets at Sri Lanka; offered mainly fresh.

Local Names : -

Literature : Kyushin et al. (1977, as Lutjanus sp.); Fischer & Bianchi (eds) (1984); Allen & Talbot (1985).

Remarks : Frequently confused with other large red snappers such as Lutjanus malabaricus and L. sanguineus.

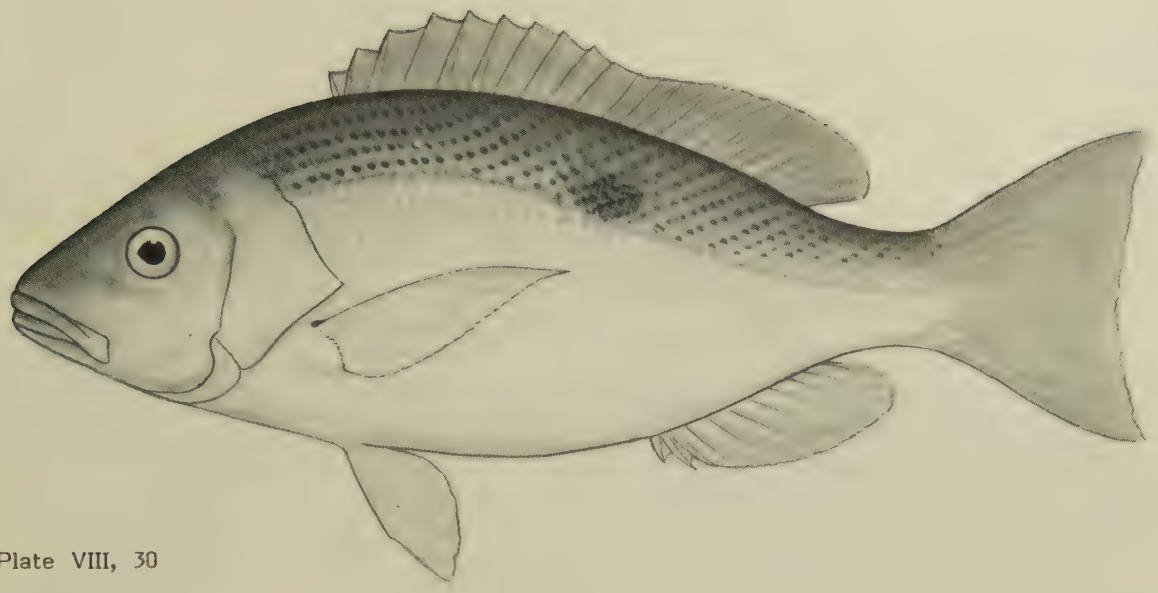
Lutjanus guttatus (Steindachner, 1869)

LUT Lut 55

Mesoprion guttatus Steindachner, 1869, Ichth.Notizen, 9:pl. 8 (Mazatlán, Mexico).

Synonyms : None.

FAO Names : En - Spotted rose snapper; Fr - Vivaneau rose; Sp - Pargo lunarejo.



See Plate VIII, 30

Diagnostic Features : Preopercular notch and knob weak; vomerine tooth patch crescentic to triangular, with a relatively short posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 14. Dorsal fin with 10 spines and 12 or 13 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins angular or rounded; pectoral fins with 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: head with bluish spots and irregular broken lines, especially across cheek; pale crimson on side, often with silvery sheen and horizontal rows of bluish spots; large blackish blotch on upper back below posterior dorsal spines; fins mainly red except anal and pelvics golden; belly golden-yellow.

Geographical Distribution : Eastern Pacific Ocean from Mexico to Peru.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 50 cm.

Interest to Fisheries : Caught with nets, trawls and handlines. Marketed either fresh or frozen.

Local Names : COLOMBIA: Pardo, Pargo lunarejo; COSTA RICA: Pargo de la mancha; ECUADOR: Pargo lunarejo; EL SALVADOR: Pargueta; GUATEMALA: Flamenco, Huachinango; MEXICO: Huachinango, Pargo chivato, Pargo de aleta negra, Pargo flamenco, Pargo lunarejo, Pargo prieto; NICARAGUA: Pargueta; PANAMA: Pargo de la mancha, Pargo de seda; PERU: Besugo, Cojinoba rosada, Paramao, Pargo, Pargo colorado, Pargo con lunar, Pargo con mancha, Pargo de altura, Parvo.

Literature : Jordan & Evermann (1896).

Lutjanus inermis (Peters, 1869)

LUT Lut 56

Mesoprion inermis Peters, 1869, Berliner Monatsber:705 (Mazatlán, Mexico).

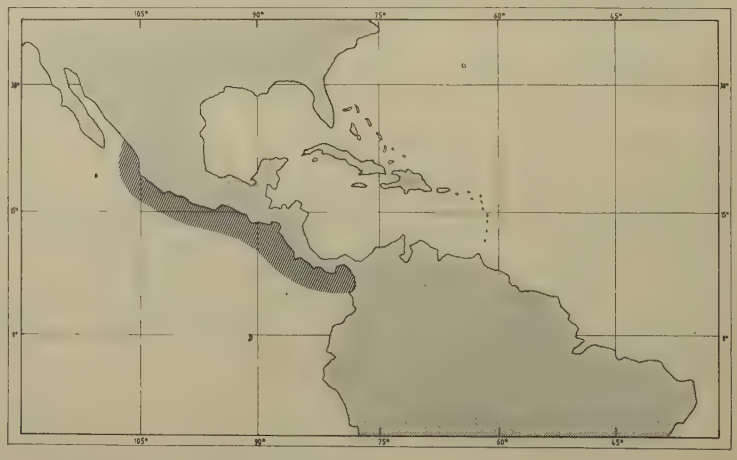
Synonyms : None.

FAO Names : En - Golden snapper; Fr - Vivaneau barbe blonde; Sp - Pargo barbirubia

See Plate VIII, 31

Diagnostic Features : Body slender and fusiform, not strongly compressed, its maximum depth about 3.5 times in standard length. Snout very pointed; mouth relatively small, the maxilla extending to front of eye; eye large, about 4 times in head length; preopercular notch and knob weak; teeth in jaws small and conical, slightly enlarged at front; vomerine tooth patch triangular with a short medial posterior extension; tongue with patch of granular teeth; gill rakers on lower limb of first arch 14 or 15 (only 10 distinct). Dorsal fin with 10 weak spines and 13 soft rays; anal fin with 3 weak spines and 11 soft rays; posterior profile of dorsal and anal fins low and angular; pectoral fins short, about equal to or only slightly longer than pelvic fins, with 17 rays; caudal fin lunate or forked. Scale rows on back rising obliquely above lateral line. Colour: live colouration unknown, but probably pink or reddish with darker horizontal stripes corresponding with scale rows on sides.

Geographical Distribution : Eastern Pacific Ocean from Mexico to Panama.



Habitat and Biology : Unknown.

Size : Maximum total length at least 30 cm.

Interest to Fisheries : Of potential interest, but apparently caught in low numbers.

Local Names : COLOMBIA: Pargo chino; MEXICO: Barbirrubia, Rubia, Rabirubia; PANAMA: Pargo viviano.

Literature : Jordan & Evermann (1896).

Remarks : Included in the genus Rabiruba Jordan & Fesler by some authors.

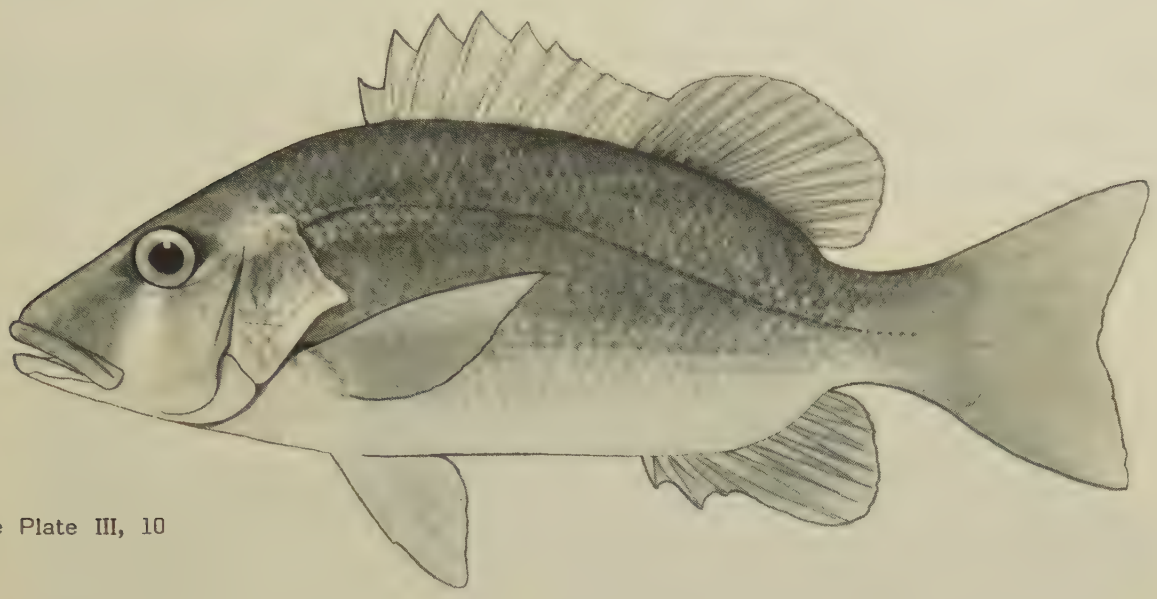
Lutjanus jocu (Bloch & Schneider, 1801)

LUT Lut 19

Anthias jocu Bloch & Schneider, 1801, Syst.Ichthy.:310 (Cuba).

Synonyms : Mesoprion litura Cuvier (in C. & V., 1828).

FAO Names : En - Dog snapper; Fr - Vivaneau chien; Sp - Pargo jocú.



See Plate III, 10

Diagnostic Features : Body relatively deep. Preopercular notch and knob weak; one of the pairs of canines in upper jaw notably enlarged, visible even when mouth is closed; vomerine tooth patch V-shaped or crescentic, with an elongate medial posterior extension. Dorsal fin with 10 spines and 14 (rarely 15) soft rays; anal fin rounded with 3 spines and 8 soft rays; pectoral fins long, reaching level of anus, with 16 or 17 rays; caudal fin slightly emarginate or weakly forked. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides olive brown with bronze tinge, sometimes with narrow pale bars; lower sides and belly light reddish with a copper tinge; a pale whitish, triangular bar between lower edge of eye and rear of mouth. Young with a horizontal blue line below eye which breaks into a row of spots in adults; fins brown to yellow orange.

Geographical Distribution : Tropical western Atlantic Ocean as far north as Massachusetts and south to northern Brazil. Rare north of Florida. Introduced to Bermuda.

Habitat and Biology : Adults common around coral reefs; young specimens found in coastal waters, particularly estuaries and occasionally entering rivers. Feeds mainly on fishes and benthic invertebrates, including shrimps, crabs, gastropods and cephalopods. Spawning has been reported during March off Jamaica and in the northeastern Caribbean.

Size : Maximum total length about 74 cm; common to 60 cm. Matures at about 30 to 40 cm.

Interest to Fisheries : Caught mainly with handlines, gill nets, traps and seines; often speared by divers. A good quality foodfish. Marketed fresh and frozen.

Local Names : COLOMBIA: Pargo perro; CUBA: Jocú; FRENCH GUIANA: Sarde dent chien; MEXICO: Pargo prieto; SANTO DOMINGO: Jocú.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Fischer (ed.) (1978).

Remarks : Sometimes implicated in cases of ciguatera fish poisoning.

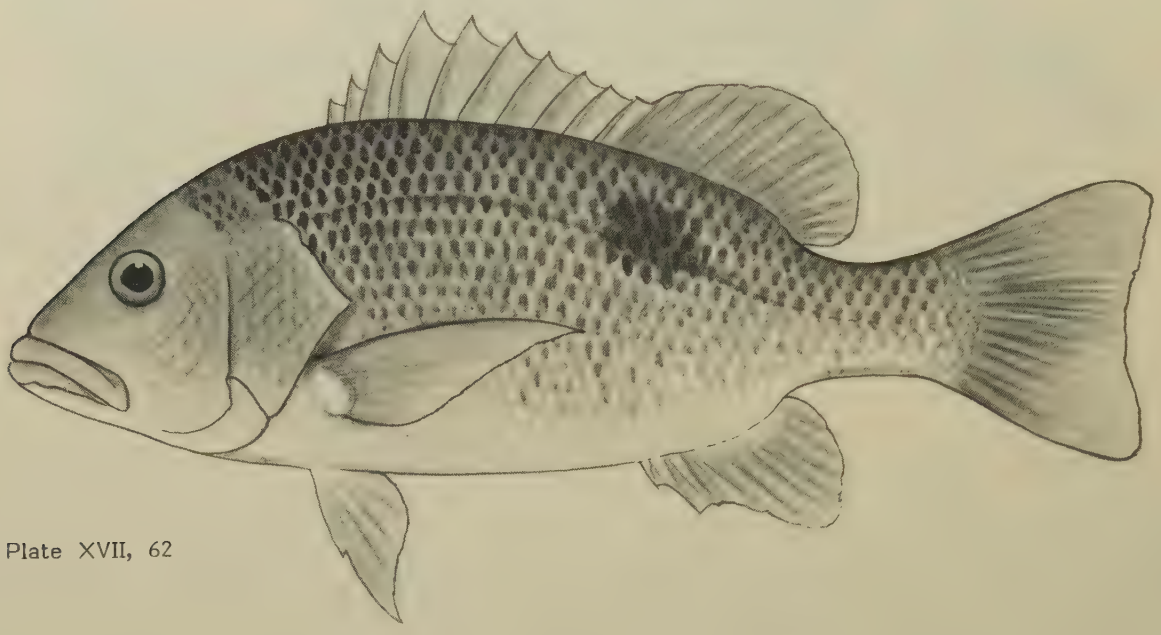
Lutjanus johnii (Bloch, 1792)

LUT Lut 6

Anthias johnii Bloch, 1792, Naturg.Ausländ.Fische, 6:113 (Suratta).

Synonyms : Sparus tranquebaricus Shaw (1803); Coius catus Buchanan (1822); Mesoprion yapilli Cuvier (in C. & V., 1828); Serranus pavoninus Valenciennes (in C. & V., 1831); Diacope xanthozona Bleeker (1845).

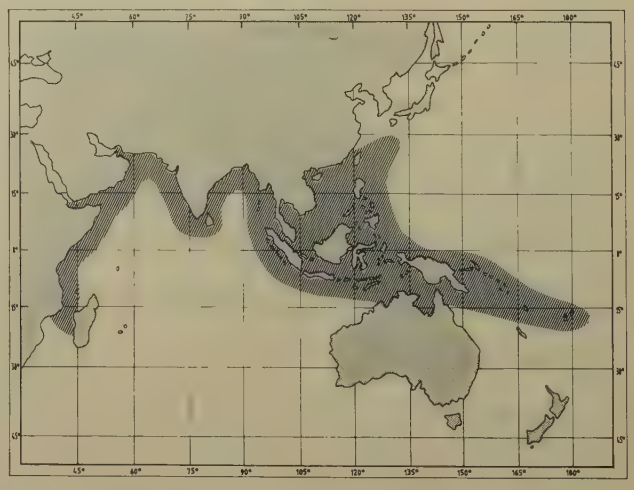
FAO Names : En - John's snapper; Fr - Vivaneau ziebelo; Sp - Pargo jaspeado.



See Plate XVII, 62

Diagnostic Features : Body moderately deep (greatest depth 2.4 to 2.9 times in standard length). Dorsal profile of head steeply sloped; preorbital width equal to eye diameter or larger; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 11, total rakers on first arch 17 or 18. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back parallel to lateral line. Colour: generally yellow with a bronze to silvery sheen, grading to silvery-white on belly and underside of head; centre of each scale often with a reddish-brown spot, giving an overall appearance of series of horizontal lines on side of body; a round black spot, larger than eye, on back, mainly above lateral line, below anterior soft dorsal rays (sometimes absent in large adults).

Geographical Distribution : Widespread in the Indo-West Pacific from the Fiji Islands to East Africa and from Australia to Ryukyu Islands.



Habitat and Biology : Little information on habitat of adults, although they probably frequent coral reef areas. Juveniles in brackish mangrove estuaries. Large adults trawled to depths of 80 m. Feeds on fishes and benthic invertebrates including shrimps, crabs and cephalopods. Spawning has been reported during September in the Andaman Sea.

Size : Maximum total length about 70 cm; common to 50 cm.

Interest to Fisheries : Frequently found in markets. Caught mainly with handlines, bottom longlines, traps and bottom trawls. Excellent quality flesh, usually marketed fresh or sometimes dried-salted.

Local Names : AUSTRALIA: Spotted-scale sea-perch; JAPAN: Minami-fuedai; KUWAIT: Naisarah; THAILAND: Pla kapong dang; THE PHILIPPINES: Bitilla, Maya-maya, Paswan.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Shen (1984, as L. argentimaculatus in part); Allen & Talbot (1985).

Lutjanus jordani (Gilbert, 1897)

LUT Lut 57

Neomaensis jordani Gilbert (in Jordan & Evermann, 1898), Bull.U.S.Nat.Mus., 47:1251 (Panama).

Synonyms : None.

FAO Names : En - Jordan's snapper; Fr - Vivaneau huachinango; Sp - Huachinango.

See Plate IX, 32

Diagnostic Features : Body relatively deep. Head pointed, dorsal profile of forehead somewhat angular; preorbital bone broad; maxilla extending nearly to mid-eye level; preoperacular notch and knob well developed; vomerine tooth patch diamond-shaped; tongue with granular teeth; gill rakers on lower limb of first arch 12 (7 are distinct). Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 9 soft rays; posterior profile of dorsal and anal fins rounded; caudal fin truncate. Scale rows on back parallel to lateral line. Colour: dark olive on upper back and top of head, dark purplish-red on sides and ventral parts; silvery spots on side forming longitudinal rows; inner lining of gill membranes and shoulder girdle largely orange-red.

Geographical Distribution : Eastern Pacific Ocean from southern Mexico to Peru; also offshore islands including Mapelo and the Cocos and Galapagos groups.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 55 cm.

Interest to Fisheries : Caught throughout its range with nets, trawls and handlines. It is marketed either fresh or frozen.

Local Names : COLOMBIA: Pargo; COSTA RICA: Pargo rojo, Pargo seda; GUATEMALA: Huachinango; MEXICO: Huachinango; PANAMA: Pargo de seda, Saltador, Saltona; PERU: Pargo colorado, Pargo rojo, Parvo rojo.

Literature : Jordan & Evermann (1896).

Lutjanus kasmira (Forsskål, 1775)

LUT Lut 36

Sciaena kasmira Forsskål, 1775, Descrip.Animal.:xi, 46 (Arabia).

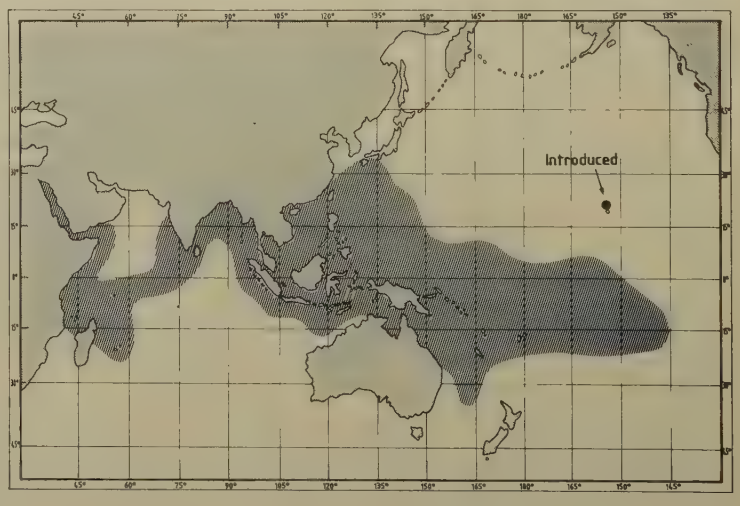
Synonyms : Diacope octolineata Cuvier (in C. & V., 1828 - in part); Mesoprion etaape Lesson (1830); Mesoprion pomacanthus Bleeker (1855 - in part).

FAO Names : En - Common bluestripe snapper; Fr - Vivaneau à raies bleues; Sp - Pargo de rayas azules.

See Plate XVII, 63

Diagnostic Features : Body moderately deep (greatest depth 2.4 to 2.8 times in standard length). Dorsal profile of head steeply sloped; preorbital width usually greater than eye diameter, but sometimes less in small specimens; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smoth, without teeth; gill rakers on lower limb of first arch (including rudiments) 13 or 14, total rakers on first arch 20 to 22. Dorsal fin with 10 spines and 14 or 15 soft rays; anal fin with 3 spines and 7 or 8 soft rays; posterior profile of dorsal and anal fins somewhat angular; pectoral fins with 15 or 16 rays; caudal fin slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and sides bright yellow; lower sides and underside of head white; 4 bright blue stripes on side; several faint greyish stripes on lowermost part of sides; fins yellow.

Geographical Distribution : Widespread in the Indo-Pacific from the Marquesas and Line Islands to East Africa, and from Australia to southern Japan.



Habitat and Biology : Inhabits coral reefs, occurring in both shallow lagoons and on outer reef slopes to depths of at least 60 m, but occurring in 180 and 265 m at the Marquesas Islands and Red Sea respectively. Frequently found in large aggregations around coral formation, caves or wrecks during daylight hours. Feeds on fishes, shrimps, crabs, stomatopods, cephalopods and planktonic crustaceans. Spawning occurs throughout most of the year in lower latitudes with peak activity reported for November and December in the Andaman Sea. Eggs measure from 0.78 to 0.85 mm in diameter and hatch in about 18 hours at 22 to 25°C.

Size : Maximum total length about 35 cm; common to 25 cm. Matures at about 20 to 25 cm.

Interest to Fisheries : Frequently found in markets. It is one of the principal species in the Hawaiian offshore handline fishery, but commands a relatively low price. Caught mainly with handlines, traps and gill nets. Usually offered fresh.

Local Names : ELLICE ISLANDS: Te savane; GILBERT ISLANDS: Te baveata; GUAM: Saas, Ta'ape; JAPAN: Yosuji-fuedai; KENYA: Mbawaa; KUWAIT: Naisarah; SAMOA: Savane; SAUDI ARABIA: Hobara, Naisarah; SEYCHELLES: Madras; SOUTH AFRICA: Blouband snapper, Bluebanded snapper; SRI LANKA: Irri ranna (S); TAHITI: Ta'ape; TANZANIA: Janja, Kelea, Tembo-uzi; THAILAND: Pla kapong; THE PHILIPPINES: Marangsi; TUAMOTUS (Raroia): Hutihuti, Tohare.

Literature : Kyushin et al. (1977); Randall (1983); Fischer & Bianchi (eds) (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

Lutjanus lemniscatus (Valenciennes, 1828)

LUT Lut 5

Serranus lemniscatus Valenciennes (in C. & V.), 1828, Hist.Nat.Poiss., 2:240 (Ceylon).

Synonyms : Mesoprion immaculatus Cuvier (in C. & V., 1828); Mesoprion janthinuropterus Bleeker (1852a); Lutjanus furvicaudatus Fowler (1904).

FAO Names : En - Yellowstreaked snapper; Fr - Vivaneau à raies jaunes; Sp - Pargo de rayas amarillas.

See Plate XVII, 64

juvenile

See Plate XVII, 64a

Diagnostic Features : Body moderately deep (greatest depth 2.5 to 2.8 times in standard length). Dorsal profile of head steeply sloped; snout profile slightly concave; preorbital bone usually much greater than eye diameter, at least in larger specimens; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 10 to 14, total rakers on first arch 18 to 21. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides grey-brown or olive; sides grey, brown or reddish; belly and underside of head whitish; dorsal and caudal fins brownish, remaining fins pink or reddish; juveniles with a broad black horizontal band from snout tip to caudal fin base.

Geographical Distribution : Indo-West Pacific from Australia and New Guinea to Sri Lanka and southern India, and northward to the Philippines.

Habitat and Biology : Inhabits offshore reefs to depths of 70 to 80 m. Juveniles sometimes encountered in the vicinity of coral reefs, often located close to the shore where silting is moderate and visibility reduced. Feeds on fishes and a variety of benthic invertebrates.

Size : Maximum total length about 65 cm; common to 35 cm.

Interest to Fisheries : An important market species in many localities. Caught mainly with handlines, traps and occasionally with bottom trawls. Usually offered fresh, sometimes dried-salted.

Local Names : AUSTRALIA: Dark-tailed seaperch; THE PHILIPPINES: Alangot, Bambangon, Managat, Mangagat.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Allen & Talbot (1985).

Remarks : Sometimes referred to as L. janthinuropterus and L. rangus (a junior synonym of L. bohar) by previous authors.

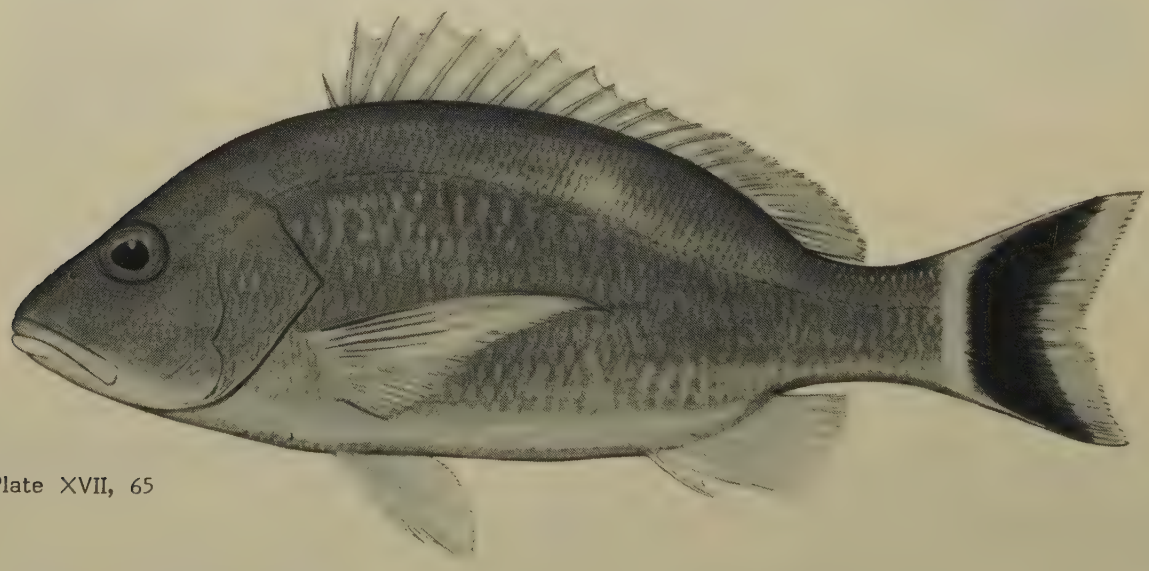
Lutjanus lunulatus (Park, 1797)

LUT Lut 37

Perca lunulata Park, 1797, Trans.Linn.Soc.London, 3:37 (Sumatra).

Synonyms : Mesoprion caudalis Valenciennes (in C. & V., 1830).

FAO Names : En - Lunartail snapper; Fr - Vivaneau queue lune; Sp - Pargo raboluna.



See Plate XVII, 65

Diagnostic Features : Body moderately deep (greatest depth 2.5 to 2.6 times in standard length). Dorsal profile of head steeply sloped; preorbital width about equal to eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 8 to 10, total rakers on first arch 15 to 18. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins somewhat angular; pectoral fins with 16 or 17 rays; caudal fin slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper side brown to reddish-pink;

reddish-pink to mauve on middle of side; rear half of maxilla, lower part of preopercle, breast and abdomen creamy-yellow; dorsal fin reddish-pink to clear; caudal fin with a broad, crescentic black band with the posterior portion of fin pink; pectoral, anal and pelvic fins yellow.

Geographical Distribution : Western Pacific and northern Indian Ocean from Vanuatu and the Philippines to the northeastern Arabian Sea.

Habitat and Biology : Inhabits coral reefs at depths between about 10 and 30 m. Usually seen solitarily or in small groups.

Size : Maximum total length about 35 cm; common to 20 cm.

Interest to Fisheries : Infrequently seen in markets. Caught mainly with handlines, traps and gill nets. Usually offered fresh.

Local Names : TANZANIA: Janja.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Allen & Talbot (1985).

Lutjanus lutjanus Bloch, 1790

LUT Lut 7

Lutjanus lutjanus Bloch, 1790, Naturg.Ausländ.Fische, 4:107 (Japan).

Synonyms : Lutjanus blochii Lacepède (1802); Diacope lineolata Rüppell (1829); Serranus nouleny Valenciennes (in C. & V., 1828); Mesoprion caroui Cuvier (in C. & V., 1831); Mesoprion erythrognathus Valenciennes (in C. & V., 1831); Mesoprion xanthopterygius Bleeker (1849); Rhomboplitoides megalops Fowler (1918).

FAO Names : En - Bigeye snapper; Fr - Vivaneau gros yeux; Sp - Pargo de Madras.

See Plate XVIII, 66

Diagnostic Features : Body fusiform, slender (greatest depth 2.9 to 3.3 times in standard length). Dorsal profile of head gently sloped; preorbital bone very narrow, much less than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 17 to 19, total rakers on first arch 24 to 26. Dorsal fin with 10 to 12 spines and 12 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of

dorsal and anal fins angular; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: upper back golden-brown; sides silvery-white; a broad yellow to brownish stripe from eye to caudal fin base; a series of yellow horizontal lines (one per scale row) on lower half of body, and similar lines running obliquely above lateral line; fins pale yellow to whitish.

Geographical Distribution : Widespread in the Indo-West Pacific from the Solomon Islands to East Africa and from Australia to southern Japan.

Habitat and Biology : Inhabits offshore coral reefs and trawling grounds to depths of at least 90 m. Frequently seen in large schools of more than 100 individuals. Feeds on fishes and crustaceans. Spawning has been reported during March and November in the Gulf of Aden and off East Africa respectively, and from January to June in the Gulf of Suez. Estimated maximum age: at least 11 years.

Size : Maximum total length about 30 cm; common to 20 cm. Matures at about 12 cm.

Interest to Fisheries : One of the more common snappers found in the markets. Forms about 10 to 20% of the trawl catch in the Gulf of Suez. A total catch from this area of 2 256 metric tons was reported to FAO between 1979 and 1982. Caught mainly with handlines and with bottom trawls in some areas. Usually offered fresh.

Local Names : JAPAN: Kinsen-fuedai; KUWAIT: Naisarah; NEW CALEDONIA: Lutjan à lignes jaunes; SRI LANKA: Hunu ranna; TANZANIA: Janja, Sorora, Tembouzi; THAILAND: Pla kapong; THE PHILIPPINES: Burara, Maransing, Maya-maya, Nagan, Saging-saging.

Literature : Kyushin et al. (1977, L. lineolatus); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984, as L. lineolatus); Shen (1984, as L. lineolatus); Allen & Talbot (1985).

Remarks : Usually referred to as Lutjanus lineolatus by previous authors.

Lutjanus madras (Valenciennes, 1831)

LUT Lut 38

Mesoprion madras Valenciennes (in C. & V.), 1831, Hist.Nat.Poiss., 7:446 (Mahé, Seychelles).

Synonyms : None.

FAO Names : En - Indian snapper; Fr - Vivaneau madras; Sp - Pargo madraseño.

See Plate XVIII, 67

Diagnostic Features : Body fusiform, somewhat slender (greatest depth 2.6 to 3.1 times in standard length). Dorsal profile of head moderately to gently sloped; preorbital width about equal to 2/3 of eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch triangular with a medial posterior extension or diamond-shaped; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 12 to 15, total rakers on first arch 18 to 21. Dorsal fin with 10 spines and 13 (rarely 11 or 14) soft rays; anal fin with 3 spines and 8 (rarely 9) soft rays; posterior profile of dorsal and anal fins angular; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: upper back brownish; sides whitish with a series of fine yellow horizontal lines, one per scale row, on lower half of body, and similar brownish lines running obliquely above lateral line; fins yellow except pelvics frequently white or faintly yellow.

Geographical Distribution : Western Pacific and Indian Ocean from New Guinea and the Philippines to the Laccadive Islands; also found in the Seychelles.

Habitat and Biology : Inhabits coral and rocky reefs at depths between about 5 and 90 m.

Size : Maximum total length about 30 cm; common to 20 cm.

Interest to Fisheries : Common in some markets, for example at Sri Lanka. Caught mainly with handlines, traps and gill nets. Usually offered fresh.

Local Names : -

Literature : Kyushin et al. (1977, L. lutjanus); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Allen & Talbot (1985).

Remarks : Usually referred to as Lutjanus lutjanus by previous authors.

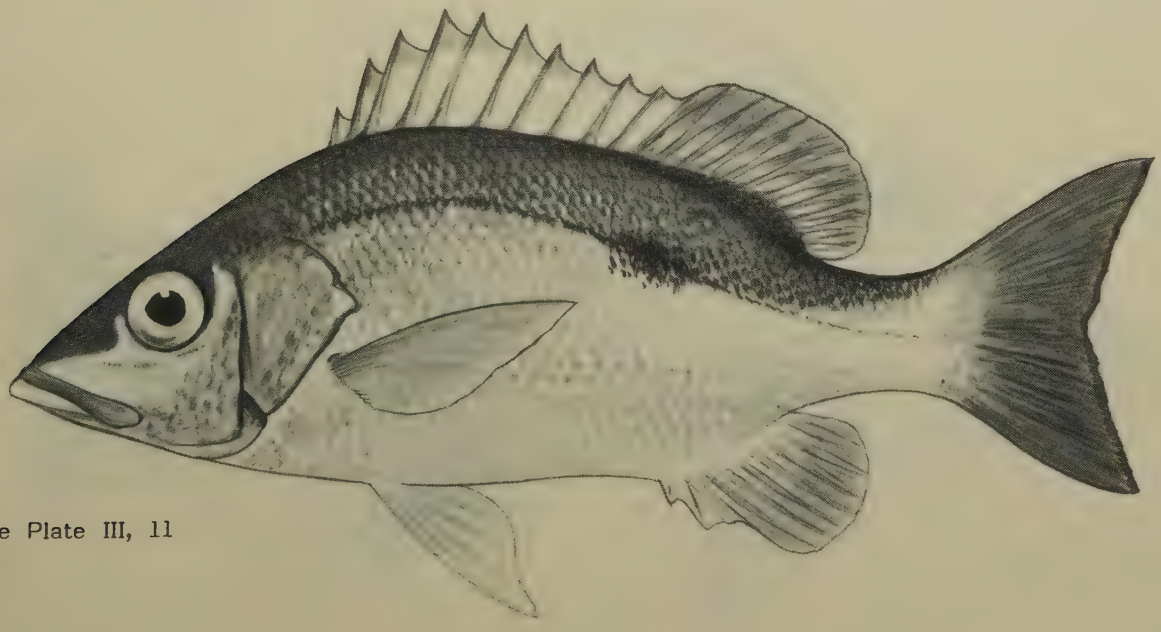
Lutjanus mahogoni (Cuvier, 1828)

LUT Lut 20

Mesoprion mahogoni Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:447 (Martinique).

Synonyms : Mesoprion ricardi Cuvier (in C. & V., 1828); Mesoprion ojanco Poey (1860).

FAO Names : En - Mahogany snapper; Fr - Vivaneau voyeur; Sp - Pargo ojón.



See Plate III, 11

Diagnostic Features : Body moderately deep. Lower jaw projecting slightly beyond upper jaw; lower corner of preopercle greatly projecting and strongly serrated; preorbital bone broad; maxilla extending nearly to mid-eye level; preopercular notch and knob moderate; canine teeth in both jaws moderately developed and about equal in size; vomerine tooth patch V-shaped or crescentic, with an elongate medial posterior extension. Dorsal fin with 10 spines and 12 (rarely 11) soft rays; anal fin rounded, with 3 spines and 8 soft rays; pectoral fins with 14 or 15 rays; caudal fin moderately forked. Scale rows on back rising obliquely above lateral line. Colour: back and upper side grey to dark olive grading to silvery on lower sides and belly; usually with a red tinge over entire body; usually a black spot, about eye size, on upper back at level of lateral line below anterior dorsal soft rays; fins usually reddish to yellow, caudal fin with a dusky margin.

Geographical Distribution : Tropical western Atlantic Ocean as far north as the Carolinas and south to Venezuela. Common at Bermuda and islands of the Caribbean.

Habitat and Biology : Inhabits clear shallow waters over rocky bottoms in the vicinity of coral reefs, less frequently in sandy or seagrass areas. often forms large aggregations during the day. Feeds at night mainly on small fish, shrimps, crabs and cephalopods. Spawning has been reported during August in the northeastern Caribbean Sea.

Size : Maximum total length of 48 cm; common to 38 cm.

Interest to Fisheries : Of interest to both commercial and sport fisheries because of the good quality flesh. Caught mainly with traps, gill nets, and angling gear. Marketed mostly fresh and frozen.

Local Names : CUBA: Ojanco; MARTINIQUE: Sarde; SANTO DOMINGO: Ojanco.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Fischer (ed.) (1978).

Lutjanus malabaricus Schneider, 1801

LUT Lut 10

Sparus malabaricus Schneider (in Bloch & Schneider), 1801, Syst.Ichth.:278 (Coromandel).

Synonyms : Mesoprion dodecacanthus Bleeker (1853).

FAO Names : En - Malabar blood snapper; Fr - Vivaneau malabar; Sp - Pargo malabárico.

See Plate XVIII, 68

Diagnostic Features : Body relatively deep (greatest depth 2.2 to 2.8 times in standard length). Dorsal profile of head steeply sloped; snout profile straight or slightly concave; preorbital bone much broader than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic or traingular, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 12 to 14, total rakers on first arch 18 to 20. Dorsal fin with 11 spines and 12 to 14 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins slightly rounded to angular; pectoral fins with 16 or 17 rays; caudal fin truncate. Scale rows on back rising obliquely above lateral line. Colour: back and sides red or red-orange, lighter on lower parts; fins reddish; juveniles with a broad, oblique band of brown or black from upper jaw to beginning of dorsal fin, and a prominent black band across caudal peduncle with a pearly-white anterior border; young also with a series of narrow reddish horizontal lines (sometimes absent) on sides.

juvenile

See Plate XVIII, 68a

Geographical Distribution : Widespread in the Indo-West Pacific from the Fiji Islands to the Arabian Sea and Persian Gulf, and from Australia to southern Japan.

Habitat and Biology : Inhabits both coastal and offshore reefs. In Australia it frequently forms mixed shoals with L. erythropterus. Depth range from about 12 to 100 m. Feeds mainly on fishes and benthic crustaceans. Spawning occurs throughout most of the year in lower latitudes with peak activity during spring and summer at New Caledonia. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.31 and 0.42 respectively for the Vanuatu (New Hebrides) population (Brouard & Grandperrin, 1984). Estimated maximum age: 10 to 12 years.

Size : Maximum total length about 100 cm; common to 50 cm.

Interest to Fisheries : An excellent food fish, found regularly in markets but usually in small quantities. One of the principal market fishes of Kuwait and other "Gulf" ports (over 25 000 metric tons landed at Kuwait between 1980 and 1984) Also constitutes about 5% of trawl catch on the Northwest Shelf of Australia in combination with L. erythropterus and L. sebae (1971 to 1976 data). Caught mainly with handlines, bottom longlines and bottom trawls. Marketed fresh or dried-salted.

Local Names : AUSTRALIA: Scarlet sea-perch; JAPAN: Yoko-fuedai; KUWAIT: Hamrah; MADAGASCAR: Bobtsy, Fiamasiaka, Fiamena; NEW CALEDONIA: Perch écarlate; PALAU: Sebus; SAUDI ARABIA: Hamrah; SRI LANKA: Gola, Konde sevalai (T), Para galla (S); THAILAND: Pla kapong dang; THE PHILIPPINES: Ahaan, Bakba-an, Dapak, Lapu-lapu, Maya-maya, Polahan.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984, as L. erythropterus); Shen (1984, as L. erythropterus in part); Allen & Talbot (1985).

Remarks : Frequently misidentified as L. sanguineus. There are unsubstantiated reports of this species off East Africa.

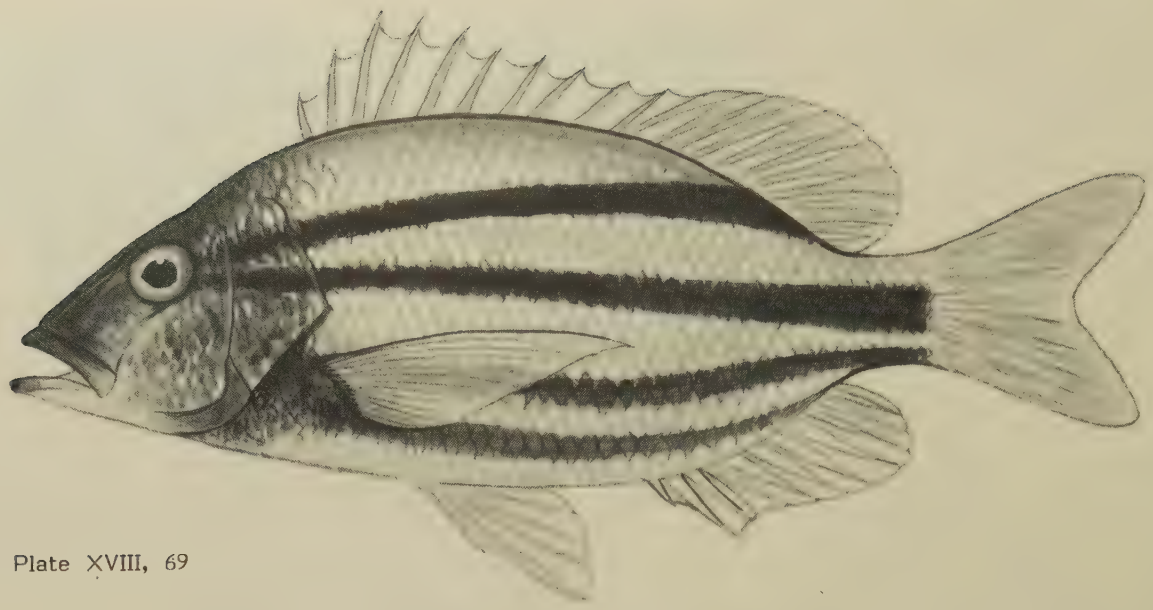
Lutjanus maxweberi Popta, 1921

LUT Lut 58

Lutjanus max weberi Popta, 1921, Meded.Rijks.Mus.Natuurl.Hist.Leiden, 6:203 (Celebes).

Synonyms : Lutjanus palmeri Fowler (1931).

FAO Names : En - Pygmy snapper; Fr - Vivaneau nain; Sp - Pargo enano.



See Plate XVIII, 69

Diagnostic Features : Body relatively deep (greatest depth 2.2 to 2.7 times in standard length). Dorsal profile of head steeply sloped; preorbital bone narrow, its width slightly less than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic or triangular, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 10 to 12, total rakers on first arch 16 to 19. Dorsal fin with 10 spines and 13 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded to slightly angular; pectoral fins with 16 rays; caudal fin emarginate. Scale rows on back parallel to lateral line. Colour: live colours unknown, but probably whitish with 4 dark brown to blackish stripes on sides; older specimens becoming overall brownish except whitish on ventral surface.

Geographical Distribution : The Philippines, Indonesia (Sulawesi) and New Guinea.

Habitat and Biology : Apparently restricted to freshwater streams and brackish estuaries, although adult specimens are unknown.

Size : Maximum total length of known specimens 15 cm, but adults unknown.

Interest to Fisheries : A poorly known species, of little interest to fisheries.

Local Names : -

Literature : Allen & Talbot (1985).

Lutjanus mizenkoi Allen & Talbot, 1985

LUT Lut 59

Lutjanus mizenkoi Allen & Talbot, 1985, Indo-Pacific No. 5:40 (Western Samoa).

Synonyms : None.

FAO Names : En - Samoan snapper; Fr - Vivaneau de Sâmoa; Sp - Pargo de Samoa.

See Plate XIX, 70

Diagnostic Features : Body relatively slender (greatest depth 2.9 to 3.0 times in standard length). Dorsal profile of head gently sloped; preorbital bone narrower than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch diamond-shaped; tongue with granular teeth; gill rakers on lower limb of first arch (including rudiments) 9 or 10, total rakers on first arch 15 or 16. Dorsal fin with 10 spines and 13 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and sides reddish grading to pink; ventral portion of head and body white; a series of faint, yellow horizontal lines, one per scale row on sides; fins whitish or yellow.

Geographical Distribution : Known only from Samoa and Indonesia (Sulawesi).

Habitat and Biology : Inhabits offshore reefs at depths between about 100 and 150 m.

Size : Maximum total length about 30 cm.

Interest to Fisheries : Of potential interest to fisheries if sufficient stocks can be located. A small, but excellent foodfish occasionally found in markets in Western Samoa; Caught mainly with deep handlines. Usually offered fresh.

Local Names : -

Literature : Allen & Talbot (1985).

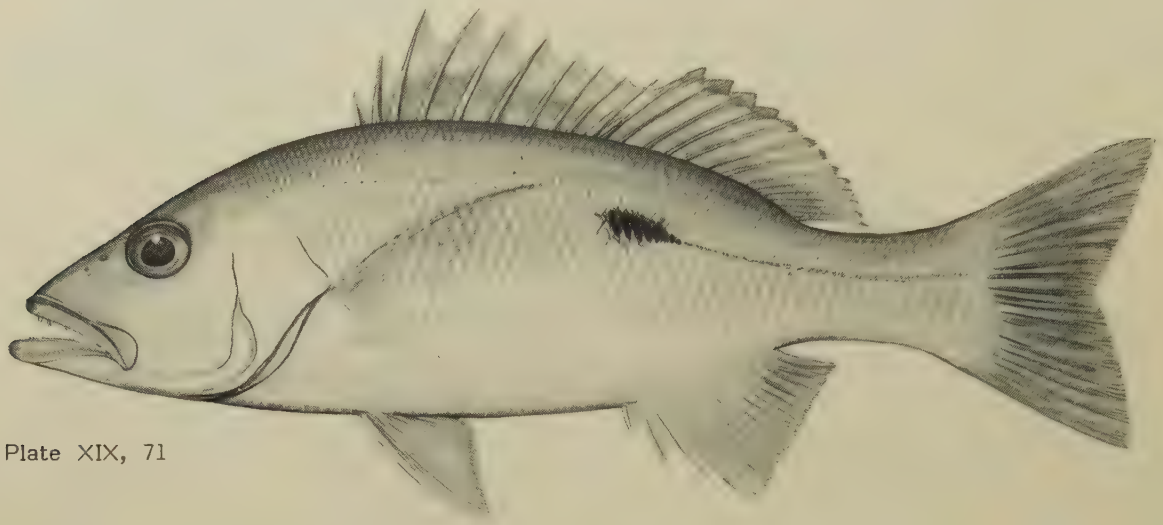
Lutjanus monostigma (Cuvier, 1828)

LUT Lut 39

Mesoprion monostigma Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:446 (Seychelles).

Synonyms : Lutjanus lioglossus Bleeker (1873)

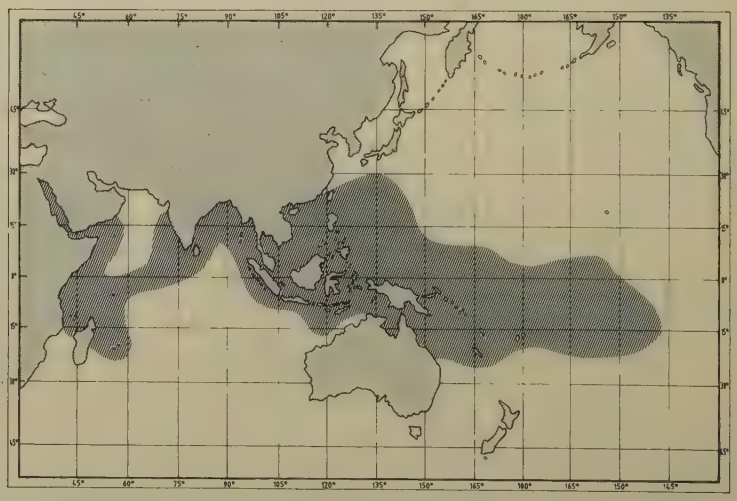
FAO Names : En - One-spot snapper; Fr - Vivaneau eglefin; Sp - Pargo eglefino.



See Plate XIX, 71

Diagnostic Features : Body moderately deep to somewhat slender (greatest depth 2.6 to 3.0 times in standard length). Dorsal profile of head gently to moderately sloped; preorbital width about equal to eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 10 or 11, total rakers on first arch 18 or 19. Dorsal fin with 10 spines and 13 (rarely 14) soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins rounded to somewhat angular; pectoral fins with 15 to 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: generally yellowish to pinkish with dusky scale margins; grey or brown on upper back and dorsal portion of head; a black spot, sometimes faint or absent, on back below anterior soft dorsal rays; fins yellowish.

Geographical Distribution : Widespread in the Indo-Pacific from the Marquesas and Line Islands to East Africa, and from Australia to the Ryukyu Islands.



Habitat and Biology : Inhabits coral reef areas, usually close to shelter in the form of caves, large coral formations, and wreckage. Solitary in habit or occurring in small groups. Depths range from about 5 to 30 m. Feeds mainly on fishes and benthic crustaceans. Spawning has been reported during February and November off East Africa.

Size : Maximum total length about 60 cm; common to 50 cm.

Interest to Fisheries : An important market fish in many areas, particularly in Oceania, although the flesh is sometimes poisonous (ciguatera). Caught mainly with handlines, traps and gill nets. Marketed mostly fresh.

Local Names : ELLICE ISLANDS: Te taiva; GILBERT ISLANDS: Te tinaemia; JAPAN: Itten-fuedai; PALAU: Derringl; SAMOA: Taiva; SOUTH AFRICA: Eenkol-snapper, Onespot snapper; TAHITI: Taivaiva; TANZANIA: Changu-kibaba; THAILAND: Pla kapong dang; THE PHILIPPINES: Darag-darag, Labungan, Maya-maya, Siksik, Telingan; TUAMOTUS (Raroia): Puaki (small), Tero (medium), Parai (large).

Literature : Randall (1983); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Allen & Talbot (1985).

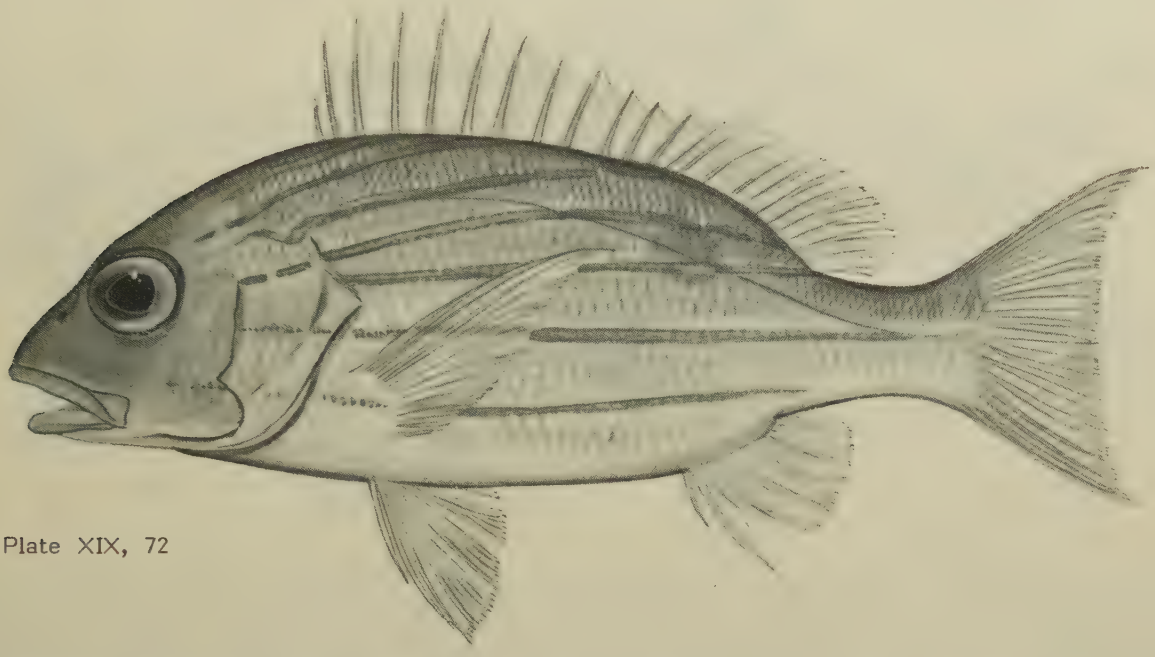
Lutjanus notatus (Cuvier, 1828)

LUT Lut 33

Diacope notatus Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:422 (Indian Ocean).

Synonyms : Diacope duodecemlineata Valenciennes (in C. & V., 1830); Diacope coeruleovittata Valenciennes (in C. & V., 1830); Diacope angulus Bennett (1831); Lutjanus octolineatus Fourmanoir (1957).

FAO Names : En - Bluestriped snapper; Fr - Vivaneau à raies bleues; Sp - Pargo docenario.



See Plate XIX, 72

Diagnostic Features : Body moderately deep (greatest depth 2.5 to 2.7 times in standard length). Dorsal profile of head steeply sloped; preorbital width usually less than eye diameter; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 13, total rakers on first arch 20. Dorsal fin with 11 or 12 spines and 12 or 13 soft rays; anal fin with 3 spines and 7 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 15 or 16 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: anterior part of back and upper part of head brownish; sides yellow, grading to pale yellowish-white ventrally; a series of 6 narrow blue stripes on sides, the 3 uppermost slanting posteriorly toward dorsal fin base; a blackish spot, about pupil-size, frequently present below anterior part of soft dorsal fin rays at level of lateral line; fins mainly yellow.

Geographical Distribution : Southwestern Indian Ocean, including Natal, Mozambique, Madagascar, Réunion and Mauritius.

Habitat and Biology : Inhabits coral reefs at depths between about 10 and 40 m. Usually occurs solitarily or in small groups of about 5 to 10 individuals.

Size : Maximum total length about 25 cm; common to 20 cm.

Interest to Fisheries : Mainly important to local artisanal fisheries and frequently seen in relatively small quantities in fish markets. Caught mainly with handlines, traps and gill nets. Offered mostly fresh.

Local Names : -

Literature : Fischer & Bianchi (eds) (1984, as L. duodecemlineatus); Allen & Talbot (1985).

Remarks : Sometimes referred to as Lutjanus duodecemlineatus.

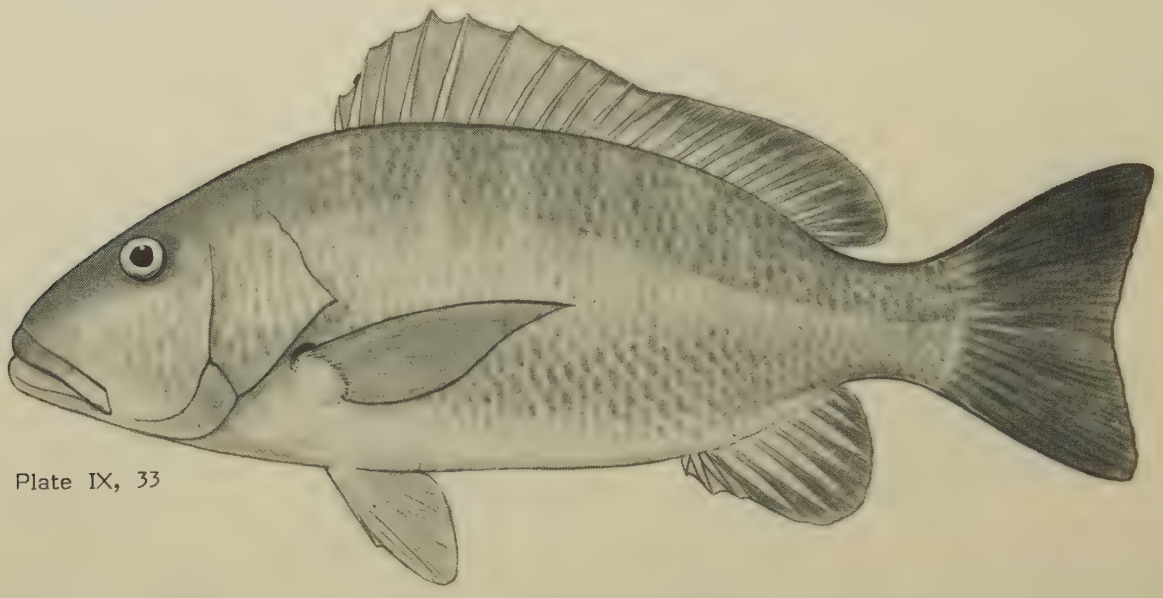
Lutjanus novemfasciatus Gill, 1862

LUT Lut 60

Lutjanus novemfasciatus Gill, 1862, Proc.Acad.Nat.Sci.Philadelphia, 251 (Cape San Lucas).

Synonyms : Mesoprion pacificus Bocourt (1868); Lutjanus prieto Jordan & Gilbert (1881).

FAO Names : En - Dog snapper; Fr - Vivaneau charbonnier; Sp - Pargo negro.



See Plate IX, 33

Diagnostic Features : Snout rounded, preopercular notch and knob moderate or weak; vomerine tooth patch crescentic, without a medial posterior extension; tongue with one or more patches of granular teeth; gill rakers on lower limb of first arch 12 (5 are very low rudiments). Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded to angular; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line, rows occasionally horizontal in juveniles; scales between lateral line and base of dorsal fin (at middle of spinous portion) 4; scale rows on cheek 5 or 6. Colour: dark olive brown to copper-red, or purplish on back and sides, becoming whitish on ventral parts; fins mainly brownish; inside of mouth reddish-yellow. Young with 9 dark cross-bars; margin of spinous dorsal and most of anal fin black.

Geographical Distribution : Eastern Pacific Ocean from northern Mexico to Panama.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 65 cm.

Interest to Fisheries : Caught with nets, trawls, and handlines. Marketed either fresh or frozen.

Local Names : COSTA RICA: Pargo jilguero, Pargo negro; EL SALVADOR: Pargo, Parvo; GUATEMALA: Huachinango, Panza prieta; MEXICO: Boca fuerte, Huachinango, Pargo colorado, Pargo moreno, Pargo negro, Pargo prieto; PANAMA: Pargo.

Literature : Jordan & Evermann (1896).

Remarks : There are unsubstantiated reports of this species from localities as far south as northern Peru.

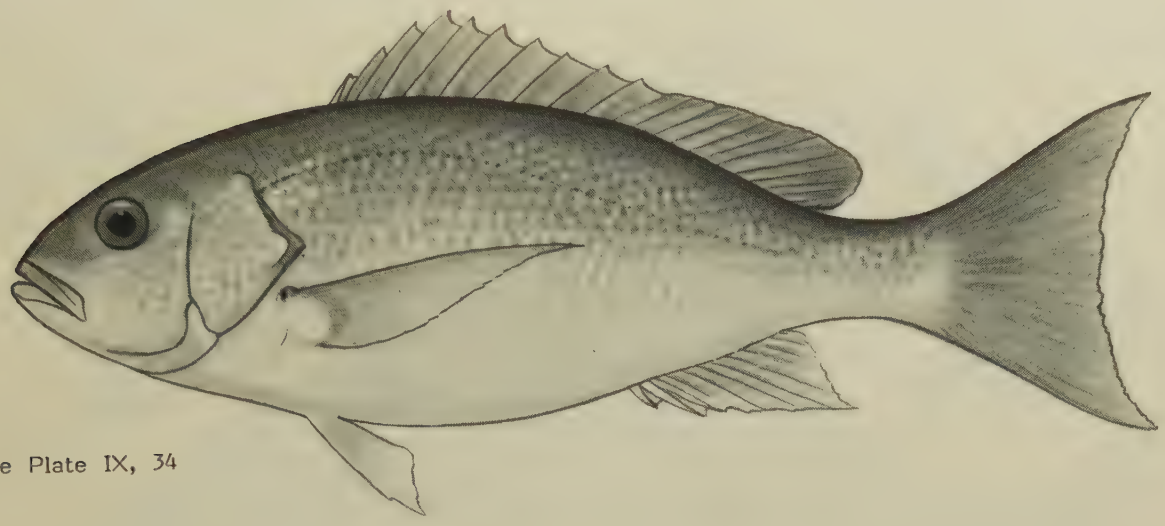
Lutjanus peru (Nichols & Murphy, 1922)

LUT Lut 61

Neomaenis peru Nichols & Murphy, 1922, Bull.Amer.Mus.Nat.Hist., 46(9):508 (Lobos de Tierra, Peru).

Synonyms : None.

FAO Names : En - Pacific red snapper; Fr - Vivaneau garance; Sp - Pargo gringo.



See Plate IX, 34

Diagnostic Features : Preorbital bone very broad in adults; large specimens develop a groove from front of eye to nostrils, and on upper part of preopercle behind the eye; preopercular notch and knob weak; vomerine tooth patch roughly diamond-shaped; tongue with one or more patches of granular teeth. Dorsal fin with 10 spines and 13 or 14 soft rays, posterior profile of fin rounded; anal fin with 3 spines and 8 soft rays, posterior profile of fin pointed; caudal fin truncate to slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: mainly red to pink with a silvery hue; fins reddish.

Geographical Distribution : Eastern Pacific Ocean from Mexico to Peru.

Habitat and Biology : An inshore, reef-dwelling species found over hard bottoms.

Size : Maximum total length about 90 cm; common to 50 cm.

Interest to Fisheries : Mainly local subsistence fishery. Caught with handlines and marketed fresh.

Local Names : ECUADOR: Gringo, Pargo rojo; MEXICO: Huachinango, Pargo rojo; PERU: Estrella.

Literature : Hildebrand (1946).

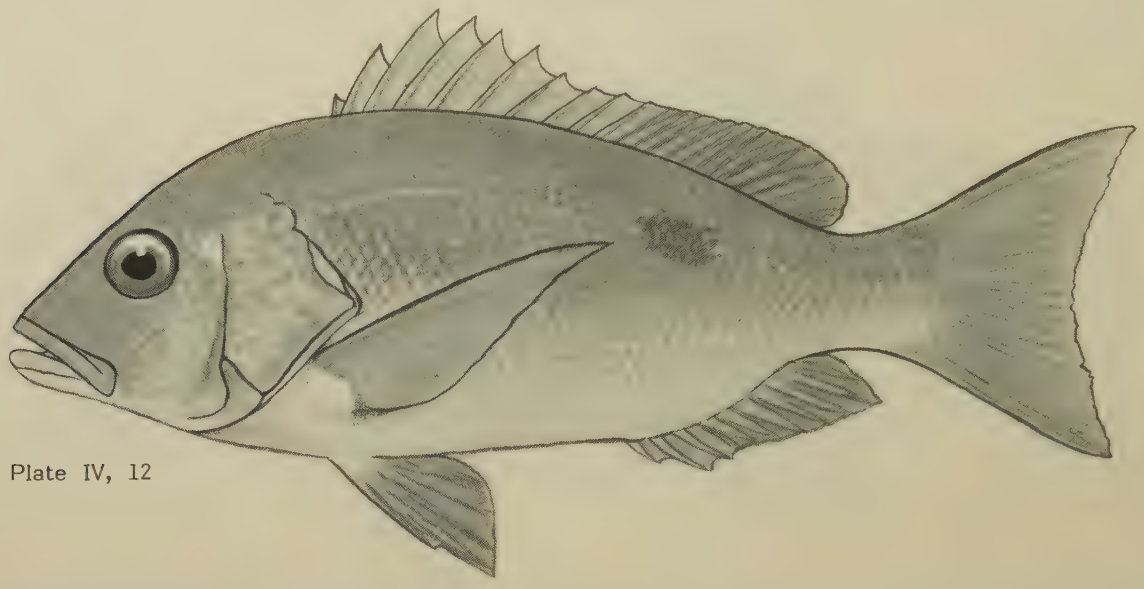
Lutjanus purpureus Poey, 1867

LUT Lut 21

Lutjanus purpureus Poey, 1867, Rep.Fisico-nat.Isla de Cuba, 2:157 (Cuba).

Synonyms : None.

FAO Names : En - Southern red snapper; Fr - Vivaneau rouge; Sp - Pargo colorado.



See Plate IV, 12

Diagnostic Features : Body moderately deep. Head short (about 2.5 to 3.0 times in standard length), its dorsal profile somewhat rounded behind eye; snout short and blunt; eye large (less than 5.6 times in head length); preopercular notch and knob weak; vomerine tooth patch V-shaped or crescentic, with a relatively short medial posterior extension. Dorsal fin with 10 spines and 14 soft rays; anal fin pointed in specimens over 5 cm length, with 3 spines and 8 (rarely 9) soft rays; pectoral fins long, reaching level of anus, with 17 rays; caudal fin deeply emarginate, the upper lobe slightly longer than the lower. Scale rows on back rising obliquely above lateral line. Colour: back and upper side deep red; lower sides and belly rosy, with a silver sheen; fins mainly red; a small dark spot sometimes present at upper pectoral fin base. Young with a rounded black spot on upper side below anterior dorsal soft rays, disappearing with growth.

Geographical Distribution : Tropical western Atlantic Ocean throughout most of the Caribbean Sea from Cuba southward to northeastern Brazil. Most abundant on the continental shelf off Honduras and Guayanas; less common around the Antilles where it is confined to deeper water.

Habitat and Biology : Inhabits rocky areas between about 30 and 160 m depth, most commonly in depths between 70 and 120 m. Feeds mainly on fishes, shrimps, crabs, cephalopods and planktonic items. Spawning occurs mainly during spring and summer. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.09 and 0.35 respectively for the northern Brazil population (Menezes & Gesteira, 1974). Estimated maximum age: 12 to 18 years.

Size : Maximum total length about 100 cm; common to 65 cm.

Interest to Fisheries : Of limited interest to commercial fisheries. In 1983 a total catch of 7 531 metric tons was reported to FAO (Fishing Areas 31 and 47). Caught mainly with bottom longlines, handlines and bottom trawls; also taken with gill nets. Flesh of good quality, marketed mainly fresh.

Local Names : BRAZIL: Vermelho; COLOMBIA: Pargo real, Pargo rojo; FRENCH GUIANA: Rouge; MARTINIQUE: Sarde rouge; SANTO DOMINGO: Colorado; VENEZUELA: Pargo colorado.

Literature : Rivas (1966); Anderson (1967); Fischer (ed.) (1978).

Remarks : Frequently confused with L. campechanus. Also referred to as L. aya by past authors, but Rivas (1966) provided evidence that indicates Bodianus aya Bloch (1790:45) is not a lutjanid, but probably a sciaenid.

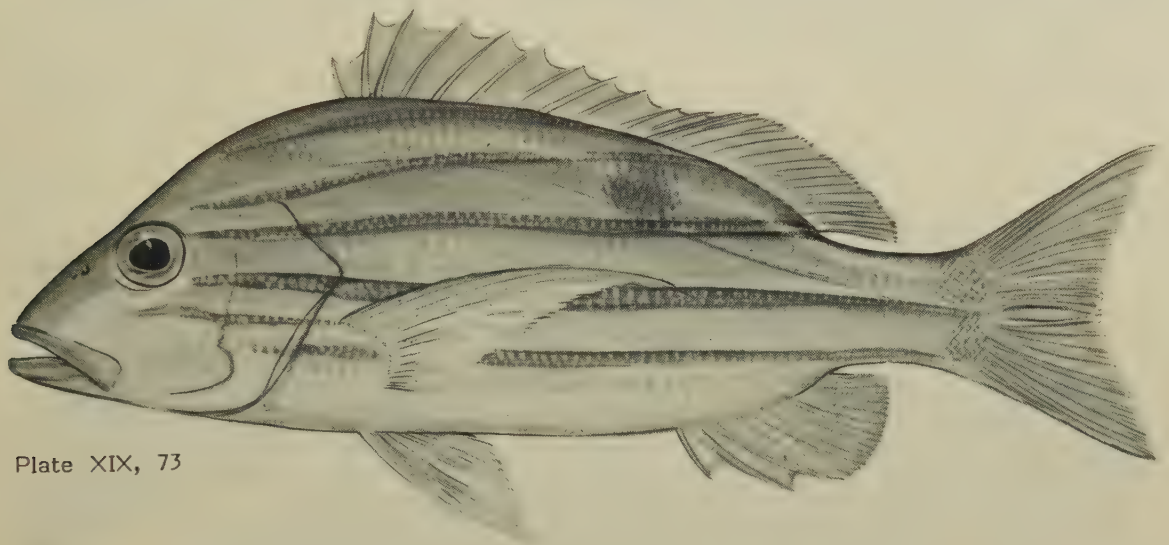
Lutjanus quinquelineatus Bloch, 1790

LUT Lut 40

Holocentrus quinquelineatus Bloch, 1790, Naturg.Ausländ.Fische, 4:84 (Japan).

Synonyms : Holocentrus quinquelinearis Bloch (1790); Diacope decemlineata Valenciennes (in C. & V., 1830); Diacope spilura Bennett (1832); Genyoroge grammica Day (1870); Genyoroge notata var. sublineata De Vis (1885a); Genyoroge notata var. sexlineata Kent (1893).

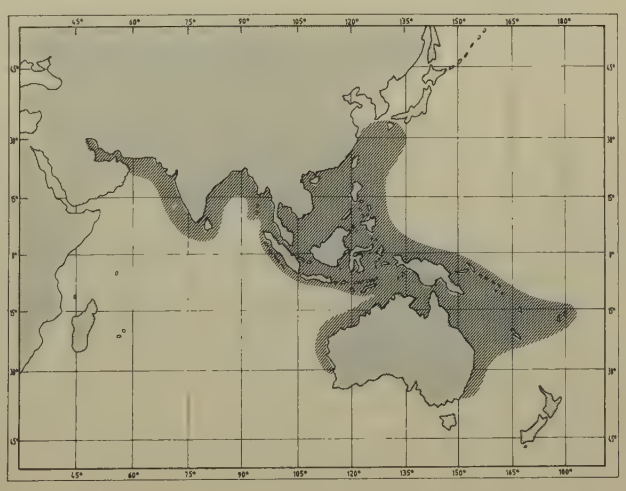
FAO Names : En - Five-lined snapper; Fr - Vivaneau à cinq bandes; Sp - Pargo de cinco lineas.



See Plate XIX, 73

Diagnostic Features : Body moderately deep (greatest depth 2.3 to 2.9 times in standard length). Dorsal profile of head steeply sloped; preorbital width usually less than eye diameter; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 13 to 15, total rakers on first arch 20 to 23. Dorsal fin with 10 spines and 13 to 15 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded to somewhat angular; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: upper part of head brownish; sides and belly bright yellow; a series of 5 bright blue stripes on sides; a round black spot, eye-sized or larger, below anteriormost soft dorsal rays at level of lateral line; fins yellow.

Geographical Distribution : Widespread in the Indo-Pacific from the Fiji Islands to the Gulf of Oman and the "Gulf", and from Australia to southern Japan.



Habitat and Biology : Inhabits sheltered lagoons and exposed, outer slope coral reefs at depths ranging from about 2 and 40 m. Frequently encountered in large aggregations inlcuding 100 or more individuals. At New Caledonia spawning occurs over most of the year with peak activity during summer (November to January).

Size : Maximum total length about 38 cm; common to 20 cm.

Interest to Fisheries : A good eating fish commonly found in markets throughout its range, also important in artisanal fisheries. Caught mainly with handlines, traps and gill nets; also sought by sport fishermen off the Queensland coast of Australia.

Local Names : AUSTRALIA: Blue-banded sea-perch; JAPAN: Rokusen-fuedai; NEW CALEDONIA: Perche à raies bleues; THE PHILIPPINES: Marangsi.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984, as L. spilurus); Shen (1984, as L. spilurus); Allen & Talbot (1985).

Remarks : Sometimes referred to as Lutjanus spilurus.

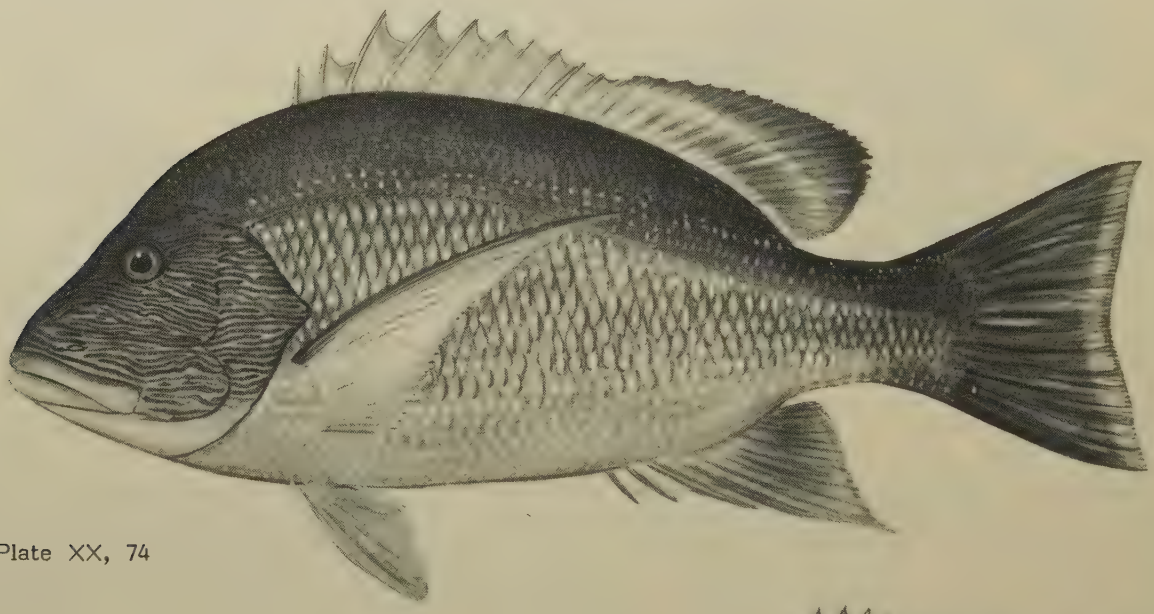
Lutjanus rivulatus (Cuvier, 1828)

LUT Lut 41

Diacope rivulata Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:414 (Coromandel; Pondicherry; Java; Red Sea; Malabar).

Synonyms : Diacope coeruleo-punctata Cuvier (in C. & V., 1828); Diacope alboguttata Valenciennes (in C. & V., 1831); Diacope revulina Swainson (1839); Mesoprion myriaster Liénard (1839); Diacope sinal Thiollière (in Montrouzier, 1857); Mesoprion quadripunctatus Günther (1859); Mesoprion parvidens Macleay (1883).

FAO Names : En - Blubberlip snapper; Fr - Vivaneau maori; Sp - Pargo maorí.



See Plate XX, 74

juvenile

See Plate XX, 74a

Diagnostic Features : Body very deep (greatest depth 2.0 to 2.4 times in standard length). Dorsal profile of head steeply sloped; preorbital bone broad, about twice the eye diameter; preopercular notch and knob moderately developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 11 or 12, total rakers on first arch 17 or 18. Dorsal fin with 10 spines and 15 or 16 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal fin rounded; posterior profile of anal fin distinctly pointed; pectoral fins with 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: generaly brown with a reddish tinge; each scale on side with a pale brown border and 2 to 3 small bluish-white spots in central portion; head with numerous undulating blue lines; lips tan; fins largely yellowish to dusky grey-brown. Juveniles with a series of 3 to 8 brown bars on sides and a chalky-white spot, with a broad blackish margin, present below anterior soft dorsal rays at level of lateral line.

Geographical Distribution : Widespread in the Indo-Pacific from Tahiti to East Africa, and from Australia to southern Japan.

Habitat and Biology : Occasionally encountered on coral reefs or shallow inshore flats. Also occurs in deeper water to at least 100 m. Found solitarily or in small groups of up to 15 to 20 fish. Feeds on fishes, cephalopods and benthic crustaceans.

Size : Maximum total length about 65 cm; common to 35 cm. Matures at about 50 cm.

Interest to Fisheries : An excellent foodfish frequently found in markets and important to artisanal fisheries. Caught with handlines, traps, and gill nets, occasionally trawled. Marketed mostly fresh.

Local Names : JAPAN: Nami-fuedai; SAMOA: Mu-mafalaugutu; SOUTH AFRICA: Speckled snapper, Spikkel-snapper; SRI LANKA: Badava (S), Kuruvilla (T); TAHITI: Haputu; TANZANIA: Chali, Janja.

Literature : Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Allen & Talbot (1985).

Lutjanus russelli (Bleeker, 1849)

LUT Lut 9

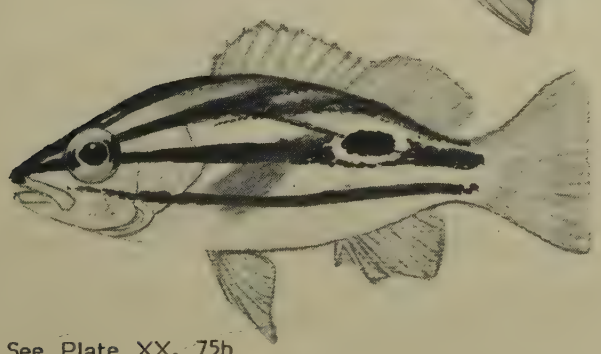
Mesoprion russelli Bleeker, 1849, Verh.Batav.Genootsch.(Percoid.), 22:41 (Malay-Moluccan Archipelago).

Synonyms : Lutianus nishikawae Smith & Pope (1907); Lutjanus orientalis Seale (1909).

FAO Names : En - Russell's snapper; Fr - Vivaneau hublot; Sp - Pargo ojo de buey.

See Plate XX, 75a

adult, Pacific

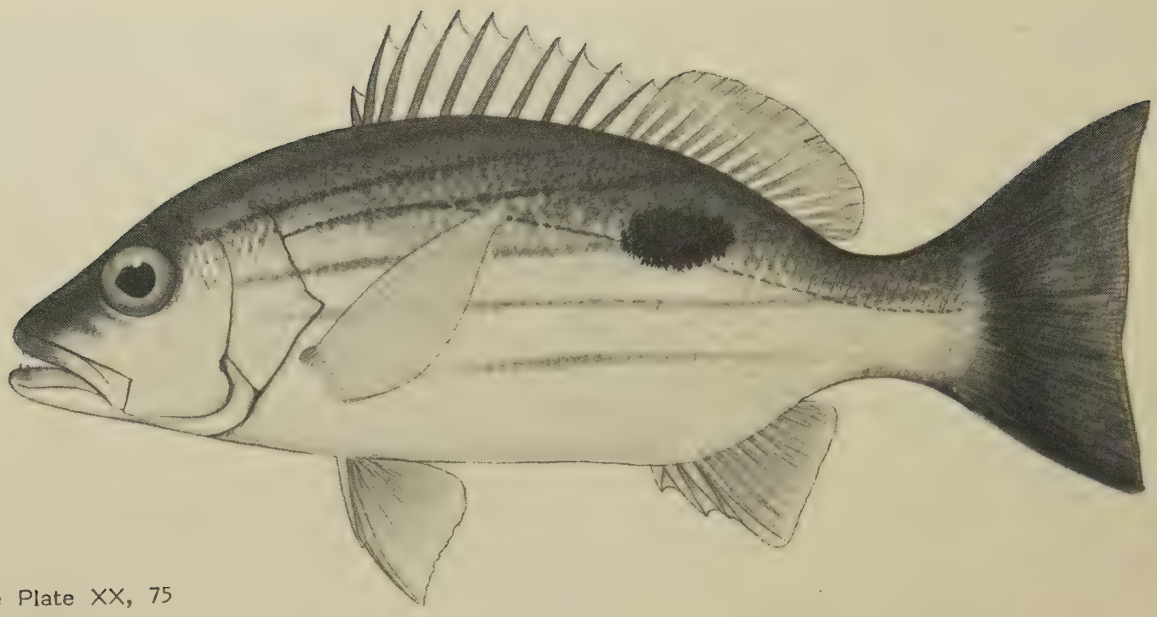


See Plate XX, 75b

juvenile, southwest Pacific

See Plate XX, 75c

juvenile, northwest Pacific



See Plate XX, 75

Indian Ocean

Diagnostic Features : Body moderately deep to somewhat slender (greatest depth 2.6 to 2.8 times in standard length). Dorsal profile of head steeply to moderately sloped; preorbital width about equal to, or slightly less than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension or diamond-shaped; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 7 to 11, total rakers on first arch 13 to 18. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded (anal fin sometimes angular); pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper side brownish; lower sides and belly pink to whitish with a silvery sheen; a black spot, mainly above lateral line, below anterior rays of soft dorsal fin; adults from the Indian Ocean usually with 7 or 8 narrow golden-brown stripes on sides; juveniles from the western Pacific whitish, with 4 black stripes on sides and with a round black spot on upper back.

Geographical Distribution : Widespread in the Indo-West Pacific from the Fiji Islands to East Africa, and from Australia to southern Japan.

Habitat and Biology : Inhabits offshore coral reefs and also inshore rock and coral reefs. Large adults are sometimes trawled well offshore in depths to about 70 to 80 m. Juveniles frequent brackish mangrove estuaries and lower reaches of freshwater streams.

Size : Maximum total length about 45 cm; common to 30 cm.

Interest to Fisheries : A common market species throughout its range; also a component of artisanal fisheries. Caught with handlines, traps and bottom trawls. Marketed mostly fresh.

Local Names : AUSTRALIA: Moses perch; KUWAIT: Naisarah; NEW CALEDONIA: Hublot; SOUTH AFRICA: Russel se snapper, Russell's snapper; TANZANIA: Janja; THAILAND: Pla kapong; THE PHILIPPINES: Bahaba, Darag-darag, Labungan, Maya-maya.

Literature : Fischer & Bianchi (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

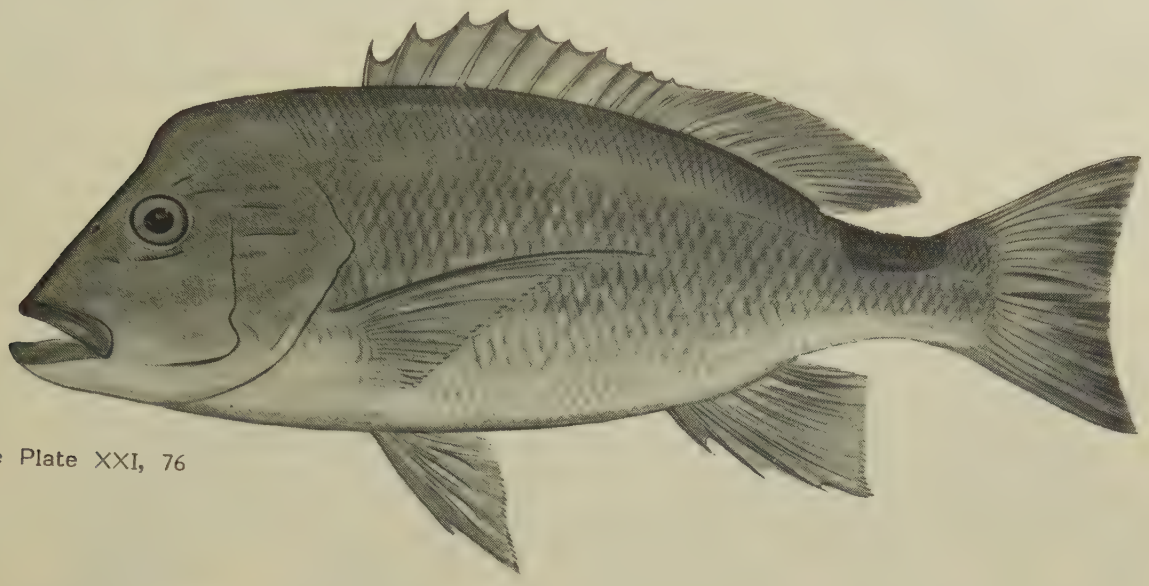
Lutjanus sanguineus (Cuvier, 1828)

LUT Lut 31

Diacope sanguinea Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:437 (Massaua, Red Sea).

Synonyms : Diacope erythrina Rüppell (1838).

FAO Names : En - Humphead snapper; Fr - Vivaneau têtu; Sp - Pargo cabezón.



See Plate XXI, 76

Diagnostic Features : Body relatively deep (greatest depth 2.3 to 2.5 times in standard length). Dorsal profile of head angular, snout steeply sloped; preorbital bone broad, much wider than eye diameter; adults with horizontal grooves behind and below eye; anterior and posterior nostrils widely spaced, the distance between them much greater than the length of posterior nostril slit; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 13 or 14, total rakers on first arch 19 to 21. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins angular; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: generally red-orange with a silvery sheen; sometimes a brownish bar from dorsal fin origin to jaw, a remnant of the juvenile coloration; roof of mouth bright yellow; juveniles with a broad brown bar from upper jaw to beginning of dorsal fin and a series of fine horizontal reddish lines on sides; a large blackish saddle on caudal peduncle preceded by a pearly-white patch.

Geographical Distribution : Western Indian Ocean and Red Sea from Natal northward to the Arabian Sea.

Habitat and Biology : Inhabits coral and rocky reefs to depths of at least 100 m. Off South Africa it displays a preference for slightly silty, turbid regions in the vicinity of sometimes shallow, offshore banks. Caught mainly at night on coral banks off Mafia Island (Tanzania) in 9 to 12 m and off Zanzibar in about 75 m. Off East Africa spawning occurs during spring and summer with peak activity in October. Estimated maximum age: 50 to 60 cm.

Size : Maximum total length about 85 cm; common to 50 cm. Matures at about 50 to 60 cm.

Interest to Fisheries : An excellent foodfish frequently seen in markets on the East African coast and along the shores of the Red Sea. The total catch from Djibouti (Gulf of Aden) reported to FAO during a one year period (1982/1983) was about 53 metric tons. Caught mainly with handlines, vertical longlines and traps, or occasionally trawled. Usually offered fresh.

Local Names : SAUDI ARABIA: Hamrah; SOUTH AFRICA: Bloed-snapper, Blood snapper; TANZANIA: Fuatundu.

Literature : Kyushin et al. (1977, as L. coccineus); Fischer & Bianchi (eds) (1984, as L. coccineus); Allen & Talbot (1985).

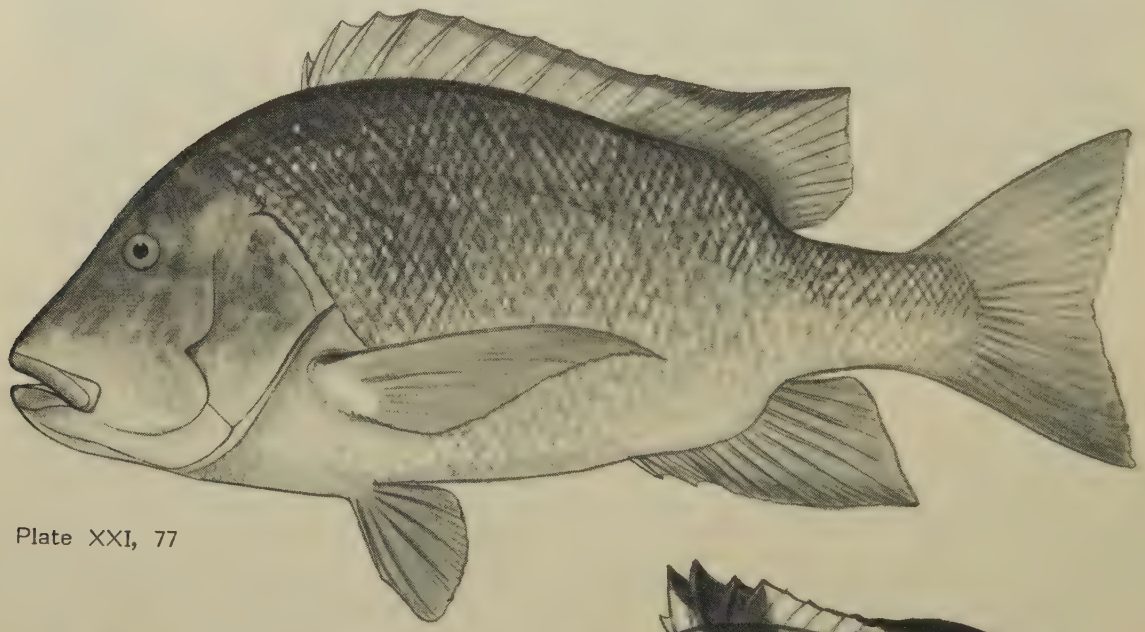
Remarks : This species has sometimes been misidentified as Lutjanus coccineus by recent authors.

Lutjanus sebae (Cuvier, 1828) LUT Lut 11

Diacope sebae Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:411 (Waigiu; Pondicherry; Java).

Synonyms : Diacope siamensis Valenciennes (in C. & V., 1830); Diacope civis Valenciennes (in C. & V., 1831); Genyoroge regia De Vis (1885a).

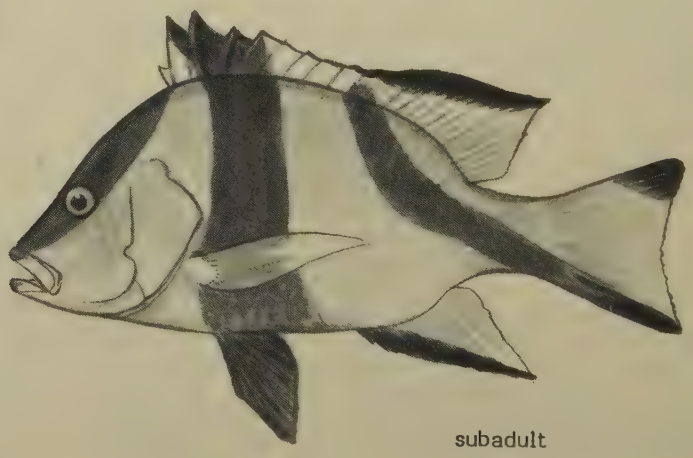
FAO Names : En - Emperor red snapper; Fr - Vivaneau bourgeois; Sp - Pargo imperial.



See Plate XXI, 77

juvenile

See Plate XXI, 77a

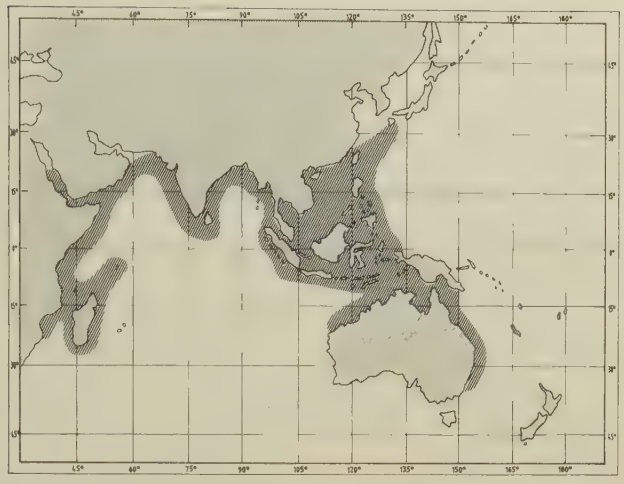


subadult

See Plate XXI, 77b

Diagnostic Features : Body very deep (greatest depth 2.1 to 2.4 times in standard length). Dorsal profile of head steeply sloped; snout profile straight or slightly convex; preorbital bone broad, much wider than eye diameter; preopercular notch and knob moderately developed; vomerine tooth patch crescentic or triangular, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 10 to 12, total rakers on first arch 16 to 19. Dorsal fin with 11 spines and 15 or 16 soft rays; anal fin with 3 spines and 10 soft rays; posterior profile of dorsal and anal fins distinctly pointed; pectoral fins with 17 rays; caudal fin slightly forked. Scale rows on back rising obliquely above lateral line. Colour: generally red or pink in adults; juveniles and smaller adults pink with a dark red band from first dorsal spine through eye to tip of snout; a second band from middle of spinous part of dorsal fin to pelvic fin; and a third band from base of last dorsal spine running obliquely downward across caudal peduncle and along lower edge of caudal fin.

Geographical Distribution : Western Pacific and Indian Ocean from Australia to southern Japan, and westward to East Africa and the southern Red Sea.



Habitat and Biology : Occurs in the vicinity of coral reefs, often over adjacent sand flats. Also trawled in deeper water on relatively flat bottoms. Small juveniles are frequently commensal with sea urchins, or sometimes found in mangrove areas. Adults range from about 10 to at least 100 m depth. Feeds on fishes, crabs, stomatopods, other benthic crustaceans and cephalopods. At New Caledonia spawning occurs mainly during spring and summer. Estimated maximum age: to at least 12 years.

Size : Maximum total length to at least 100 cm; common to 60 cm.

Interest to Fisheries : Often found in markets and a valuable component of artisanal fisheries. It is a popular sport angling fish off the Queensland coast of Australia. Caught with handlines, traps and bottom trawls. Marketed mostly fresh, but also dried-salted.

Local Names : AUSTRALIA: Red emperor; JAPAN: Sen-nendai; KENYA: Numba; MADAGASCAR: Madame tombée, Zazamanango; NEW CALEDONIA: Pouatte; SEYCHELLES: Bourgeois; SOUTH AFRICA: Emperor snapper, Keiser-snapper; TANZANIA: Dumbwara, Fuatundu, Numba; THAILAND: Pla kapong dang; THE PHILIPPINES: Ahaan, Anoping, Budlatan, Matangal, Maya-maya.

Literature : Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

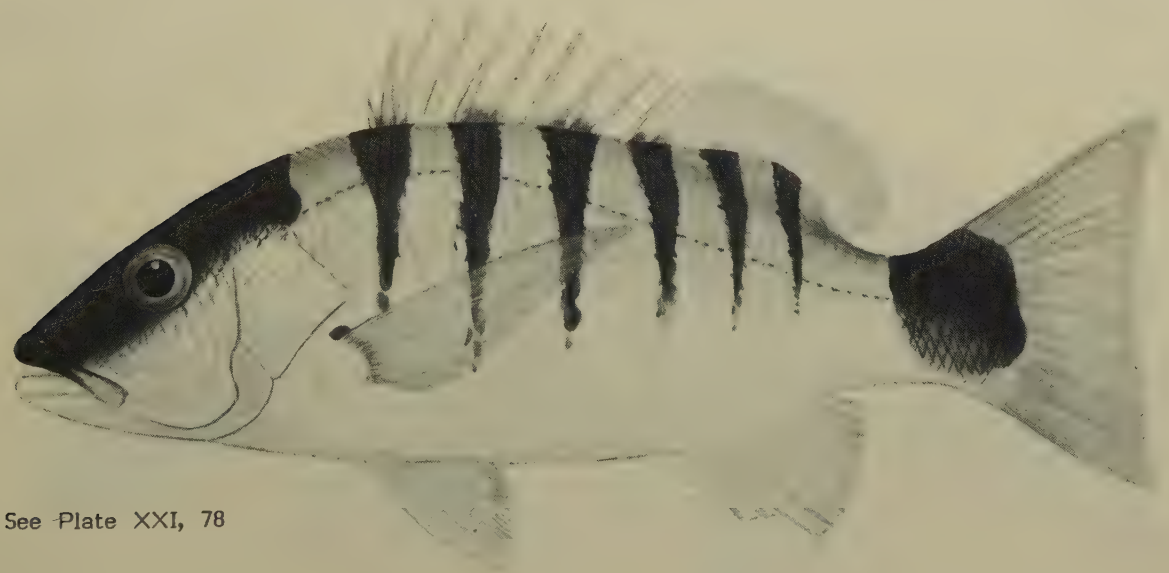
Lutjanus semicinctus Quoy & Gaimard, 1824

LUT Lut 62

Lutjanus semicinctus Quoy & Gaimard, 1824, Voy.Uranie, Zool.:303 (Rawak; Waigiu).

Synonyms : None.

FAO Names : En - Black-banded snapper; Fr - Vivaneau à bandes noires; Sp - Pargo cinteado.



See Plate XXI, 78

Diagnostic Features : Body moderately deep to relatively slender (greatest depth 2.6 to 3.1 times in standard length). Dorsal profile of head moderately sloped; preorbital width about equal to eye diameter or slightly greater; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 8 to 12, total rakers on first arch 14 to 19. Dorsal fin with 10 spines and 13 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins rounded to angular; pectoral fins with 16 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: generally pink grading to white on lower half of body; snout and forehead grey; a series of 7 narrow brown bars on upper back extending about halfway down sides; posterior half of caudal peduncle and adjacent caudal fin base black; fins mainly brownish, sometimes with a reddish hue, except pelvic and pectoral fins pale.

Geographical Distribution : Mainly southern Oceania from Tahiti to New Guinea, and extending northward to the Philippines.

Habitat and Biology : Inhabits coral reefs at depths ranging from about 10 to 30 m. Usually found solitarily or in small groups.

Size : Maximum total length about 35 cm; common to 20 cm.

Interest to Fisheries : Mainly important to artisanal fisheries, and occasionally seen in markets. Caught mostly with handlines and traps. Offered fresh.

Local Names : GILBERT ISLANDS: Te baotaburimai; NEW CALEDONIA: Lutjan à bandes noires.

Literature : Fourmanoir & Laboute (1976); Allen & Talbot (1985).

Lutjanus stellatus Akazaki, 1983

LUT Lut 63

Lutjanus stellatus Akazaki, 1983, Japan J.Ichthyol., 29(4):367 (Nichinan City, Miyazaki Prefecture, Japan).

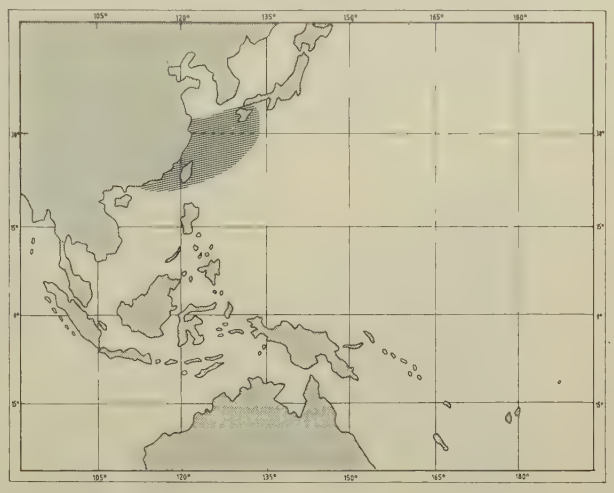
Synonyms : None.

FAO Names : En - Star snapper; Fr - Vivaneau étoilé; Sp - Pargo estrellado.

See Plate XXII, 79

Diagnostic Features : Body relatively deep (greatest depth 2.3 to 2.6 times in standard length). Dorsal profile of head moderately sloped; preorbital bone broad, about twice the eye diameter; preopercular notch and knob moderately developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 11 to 13, total rakers on first arch 16 to 19. Dorsal fin with 10 spines and 13 to 15 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal fins rounded; pectoral fins with 16 to 18 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides dark brown to purplish; lower sides purple to yellow-brown grading to pale orange on belly; a small white spot above lateral line at level of first soft dorsal rays; a blue stripe from snout to opercle; upper edge of opercle yellowish; fins greyish basally but mostly yellowish; juveniles yellowish with blue longitudinal lines on sides; a white spot bordered with black at level of lateral line below last dorsal spines; a pair of horizontal blue lines below eye; fins yellow.

Geographical Distribution : Known only from the northwestern tropical and subtropical Pacific, from southern Japan southward to the vicinity of Hong Kong.



Habitat and Biology : Occurs in the vicinity of coral and rocky reefs. Usually found solitarily or in small groups.

Size : Maximum total length about 55 cm; common to 35 cm.

Interest to Fisheries : A good eating fish found in markets of southern Japan, Taiwan Island and Hong Kong. Caught by handlines, set nets and gill nets. Usually offered fresh.

Local Names : JAPAN: Fuedai.

Literature : Masuda et al. (1984); Shen (1984); Allen & Talbot (1985).

Lutjanus synagris (Linnaeus, 1758)

LUT Lut 22

Sparus synagris Linnaeus, 1758, Syst.Nat., 10:280 (Bahamas).

Synonyms : Sparus vermicularis Bloch & Schneider (1801); Lutjanus aubrieti Desmarest (1823); Mesoprion uninotatus Cuvier (in C. & V., 1828); ? Lutjanus brachypterus Cope (1871); Neomaenis megalophthalmus Evermann & Marsh (1900).

FAO Names : En - Lane snapper; Fr - Vivaneau gazou; Sp - Pargo biajaiba.

See Plate IV, 13

shallow-water phase

See Plate IV, 13a

deep-water phase

Diagnostic Features : Body moderately deep. Snout pointed; preopercular notch and knob weak; canine teeth in both jaws moderately developed and about equal in size; vomerine tooth patch V-shaped or crescentic, sometimes with a relatively short medial posterior extension. Dorsal fin with 10 spines and 12 (rarely 13) soft rays; anal fin rounded, with 3 spines and 8 (rarely 9) soft rays; pectoral fins relatively short, not reaching level of anus, with 15 or 16 rays; caudal fin emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper side pink to reddish, with a green tinge and diffuse darker vertical bars; lower sides and belly silvery with a yellow tinge; a series of 8 to 10 horizontal yellow or golden stripes on sides and 3 or 4 irregular stripes of similar colour on head; a diffuse black spot, eye-sized or larger, just above lateral line (touching it), below anterior dorsal soft rays; fins yellowish to reddish.

Geographical Distribution : Tropical western Atlantic Ocean, northward to North Carolina and south to southeastern Brazil. Most abundant around the Antilles, on the Campeche Banck, off Panama, and the northern coast of South America.

Habitat and Biology : Found over all types of bottom, but mainly around coral reefs and on vegetated sandy areas. Ranges from shallow coastal waters to depths of 400 m. Often forms large aggregations, especially during the breeding season. Feeds at night on small fishes, bottom-living crabs, shrimps, worms, gastropods and cephalopods. Eggs have a diameter of 0.65 to 0.80 mm and hatch after 23 hours at 26°C. Estimated maximum age: 10 years.

Size : Maximum total length about 50 cm; common to 25 cm. Matures at 10 to 23 cm.

Interest to Fisheries : Of interest to commercial and sport fisheries. In 1983 a total catch of 2 267 metric tons was reported to FAO (Fishing Area 31). Along with Ocyurus chrysurus it is caught more frequently than other lutjanids in shallow insular waters of the Caribbean. Caught mainly with beach seines, boat seines, gill nets, trammel nets and bottom trawls; also with traps and handlines. Good quality flesh, marketed fresh or frozen.

Local Names : COLOMBIA: Chino; CUBA: Biajaiba; FRENCH GUIANA: Rouge; MARTINIQUE: Scude; MEXICO: Villajaiba; PUERTO RICO: Rayado; SANTO DOMINGO: Manchego; VENEZUELA: Pargo guanapo.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Fischer (ed.) (1978).

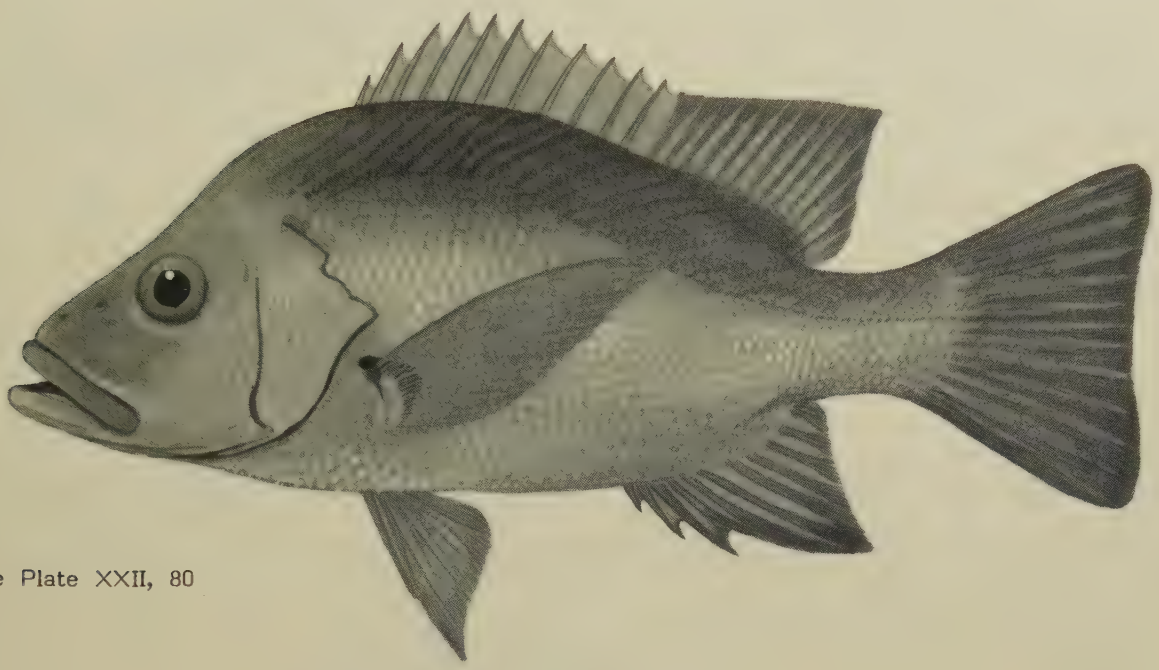
Lutjanus timorensis (Quoy & Gaimard, 1824)

LUT Lut 64

Diacope timorensis Quoy & Gaimard, 1824, Voy.Uranie Zool.:306 (Coupang, Timor).

Synonyms : Diacope calveti Cuvier (in C. & V., 1828).

FAO Names : En - Timor snapper; Fr - Vivaneau de Timor; Sp - Pargo de Timor.



See Plate XXII, 80

Diagnostic Features : Body relatively deep (greatest depth 2.2 to 2.4 times in standard length). Dorsal profile of head steeply sloped; preorbital width greater than eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; gill rakers on lower limb of first arch (including rudiments) 12 or 13, total rakers on first arch 19 or 20. Dorsal fin with 10 spines and 14 or 15 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins pointed; pectoral fins with 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides reddish; lower sides and belly red or pinkish to silvery-white; fins reddish; axil of pectoral fin black. Juveniles with a broad blackish or brownish band from upper jaw to beginning of dorsal fin and a black saddle preceded by a pearly-white border on upper edge of caudal peduncle; sides with a series of fine reddish-brown lines.

juvenile

See Plate XXII, 80a

Geographical Distribution : Mainly western Pacific Ocean from Fiji Islands to Malay Peninsula; also recorded from the Andaman Sea off Thailand.

Habitat and Biology : Inhabits coral and rubble reefs from about 20 m to at least 130 m depth. Usually occurs solitarily.

Size : Maximum total length about 50 cm; common to 30 cm.

Interest to Fisheries : A poorly known red snapper of potential interest to fisheries, although it appears to be relatively uncommon in market catches. Caught mainly with deep handlines and occasionally trawled. Marketed mainly fresh.

Local Names : SAMOA: Mala'i-pa'epa'e.

Literature : Kyushin et al. (1977, as L. malabaricus); Gloerfelt-Tarp & Kailola (1984); Allen & Talbot (1985).

Remarks : Frequently confused with other red snappers, particularly L. malabaricus.

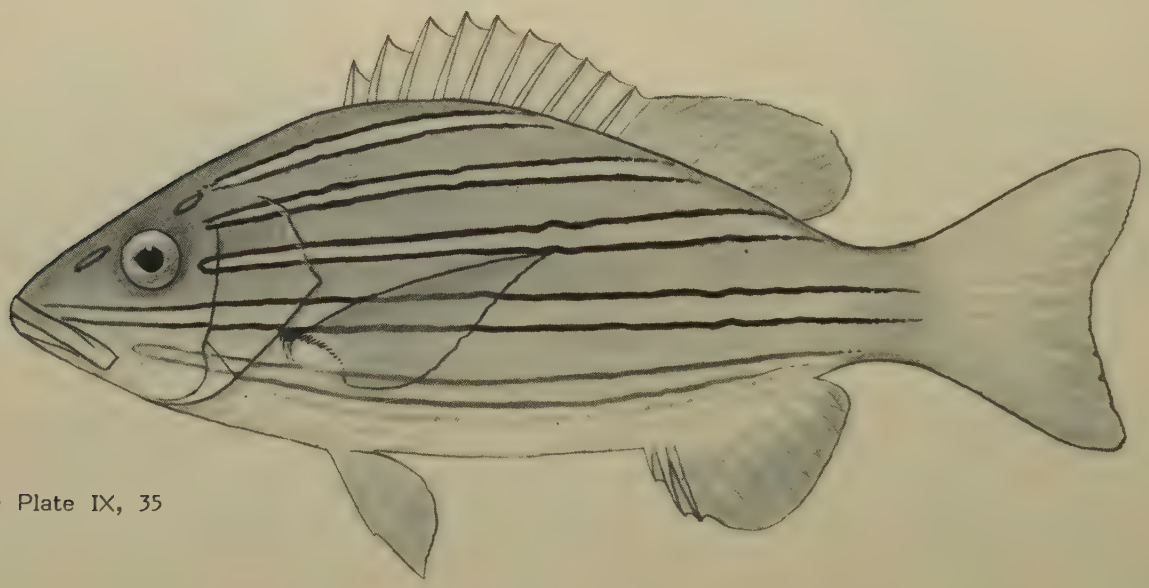
Lutjanus viridis (Valenciennes, 1845)

LUT Lut 65

Diacope viridis Valenciennes, 1845, Voyage de la Vénus:303 (Galapagos Islands).

Synonyms : None.

FAO Names : En - Blue and gold snapper; Fr - Vivaneau bleu et doré; Sp - Pargo azul dorado.



See Plate IX, 35

Diagnostic Features : Preopercular notch and knob strong; vomerine tooth patch V-shaped, without a medial posterior extension; tongue without teeth. Dorsal fin with 10 spines and 14 or 15 soft rays; anal fin with 3 spines and 8 soft rays; posterior profile of dorsal and anal fins rounded to angular; pectoral fins with 16 or 17 rays; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. Colour: bright yellow, with 5 black-edged bluish-white stripes on sides; belly whitish with narrow grey lines; fins mainly yellow.

Geographical Distribution : Eastern Pacific Ocean from Mexico to Ecuador. Most common at offshore islands including Mapelo Island, Galapagos Islands, Tres Marias and Revilla Gigedos.

Habitat and Biology : An inshore species usually frequenting coral reefs. It sometimes occurs in large schools.

Size : Maximum total length about 30 cm.

Interest to Fisheries : Limited importance in local subsistence fisheries. It is taken with nets and handlines and marketed mainly fresh.

Local Names : COLOMBIA: Pargo; MEXICO: Huachinango, Pargo rayado; PANAMA: Pargo.

Literature : Jordan & Evermann (1896).

Lutjanus vitta (Quoy & Gaimard, 1824)

LUT Lut 12

Serranus vitta Quoy & Gaimard, 1824, Voy.Uranie Zool.:58 (Waigiu).

Synonyms : Mesoprion enneacanthus Bleeker (1849); Mesoprion phaiotaeniatus Bleeker (1849); Mesoprion ophuysenii Bleeker (1860).

FAO Names : En - Brownstripe snapper or Brownstripe red snapper; Fr - Vivaneau à bande brune; Sp - Pargo bitilla.

See Plate XXII, 81

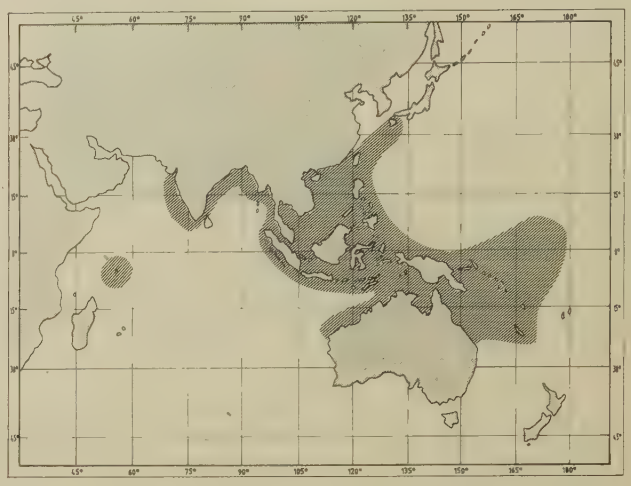
Diagnostic Features : Body moderately deep to relatively slender (greatest depth 2.6 to 3.0 times in standard length). Dorsal profile of head moderately sloped; preorbital width about equal to eye diameter; preopercular notch and knob poorly developed; vomerine tooth patch triangular with a medial posterior extension or diamond-shaped; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 9 to 12, total rakers on first arch 15 to 19. Dorsal fin with 10 spines and 12 or 13 soft rays; anal fin with 3 spines and 8 or 9 soft rays; posterior profile of dorsal and anal

juvenile

See Plate XXII, 81a

fins angular; pectoral fins with 15 or 16 rays; caudal fin slightly emarginate or truncate. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides brown, lower sides and belly whitish or pink; narrow longitudinal brown lines, one per scale row, on sides, those above lateral line slanted posteriorly toward dorsal fin base; a dark brown to blackish stripe along middle of side from eye to upper half of caudal peduncle; fins yellow except plevics whitish. Juveniles and subadults with an intensely black mid-lateral stripe and an oval black spot, eye-sized or greater, lying in the middle of the stripe below last dorsal spines.

Geographical Distribution : Mainly western Pacific and eastern Indian Ocean from New Caledonia and Gilbert Islands to southern India, extending northward to southern Japan; also found in the Seychelles.



Habitat and Biology : Inhabits the vicinity of coral reefs, also in areas of flat bottom with occasional low coral outcrops, sponges, and sea whips at depths between about 10 and 40 m. Occurs solitarily or in groups of up to about 30 individuals. Feeds on fishes, shrimps, crabs and other benthic invertebrates. At New Caledonia spawning occurs over most of the year with peak activity during spring and summer. Eggs have a diameter of 0.78 to 0.84 mm and hatch in about 26 hours at 26.5°C. The larvae grow at a rate of 1.2 to 1.7 mm per day during the first 1 or 2 months.

Size : Maximum total length about 40 cm; common to 25 cm. Matures at about 20 cm.

Interest to Fisheries : A common snapper frequently found in markets. Caught mainly with handlines, traps and bottom trawls. Usually offered fresh.

Local Names : JAPAN: Yokosuji-fuedai; NEW CALEDONIA: Jaunet; PALAU: Dodes; TANZANIA: Janja; THAILAND: Pla kapong; THE PHILIPPINES: Alongot, Bitilla, Dayang-dayang, Kamang, Macotod, Maya-maya.

Literature : Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984, partly as L. lutjanus); Shen (1984, also as L. lutjanus); Allen & Talbot (1985).

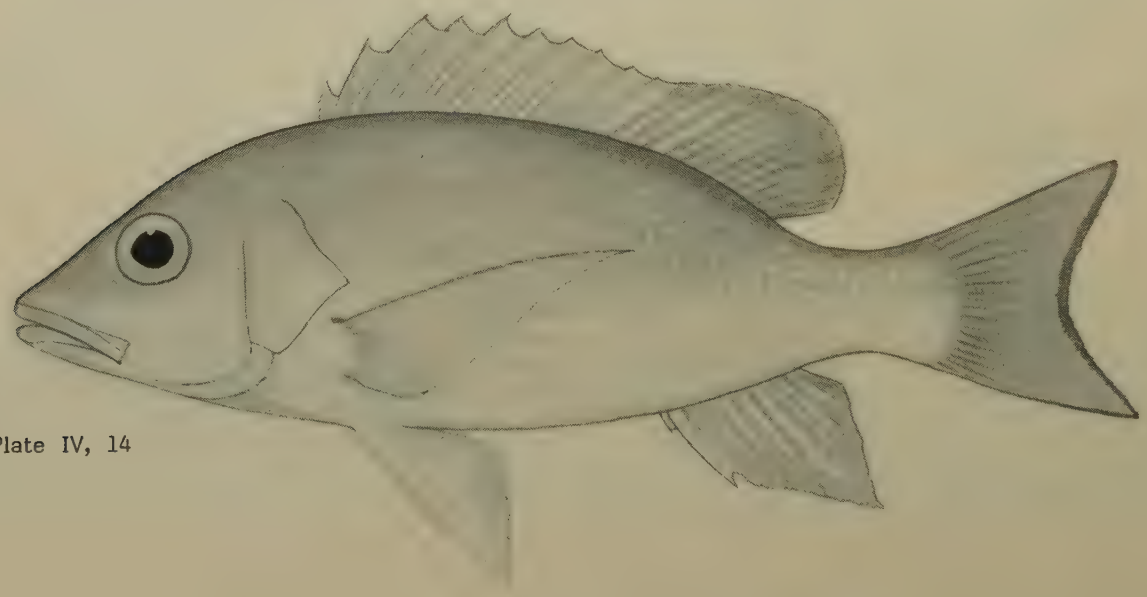
Lutjanus vivanus (Cuvier, 1828)

LUT Lut 23

Mesoprion vivanus Cuvier (in C. & V.), 1828, Hist.Nat.Poiss., 2:454 (Martinique).

Synonyms : Mesoprion profundus Poey (1860); Lutjanus torridus Cope (1871).

FAO Names : En - Silk snapper; Fr - Vivaneau soie; Sp - Pargo de lo alto.



See Plate IV, 14

Diagnostic Features : Body moderately deep. Snout relatively pointed; preopercular notch and knob weak; vomerine tooth patch V-shaped or crescentic with a medial posterior extension. Dorsal fin with 10 (rarely 11) spines and 13 or 14 soft rays; anal fin pointed in specimens larger than about 7 cm, with 3 spines and 8 (rarely 7) soft rays; pectoral fins long, reaching level of anus, with 17 (rarely 16 or 18) rays; caudal fin moderately forked. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides pink to red; lower sides and belly pinkish with a silver sheen; sides with very fine undulating yellow lines; fins mostly reddish or pale yellow; posterior margin of caudal fin sometimes deep red or dusky; young specimens (under about 25 cm) with a blackish spot on upper side below anterior dorsal soft rays.

Geographical Distribution : Tropical western Atlantic Ocean as far north as Bermuda and North Carolina and south to central eastern Brazil. Most abundant around the Antilles and the Bahamas.

Habitat and Biology : Common near the edge of the continental and island shelves at depths between 90 and 140 m; also found in deeper waters (below 200 m); usually ascending to shallower water at night. Feeds mainly on fishes, shrimps, crabs, gastropods, cephalopods, tunicates and some pelagic items including urochordates. Spawning occurs over most of the year in lower latitudes, but is seasonal (spring and summer) toward the northern and southern limits of the distribution.

Size : Maximum total length about 80 cm; common to 45 cm. Matures at 24 to 40 cm.

Interest to Fisheries : A good quality eating fish. The most commonly caught snapper off drop-offs and ledges over insular shelf breaks in the Caribbean. Caught mainly with simple and multiple handlines, also with deepwater traps. Marketed mostly fresh.

Local Names : CUBA: Pargo de lo alto; PUERTO RICO: Chillo.

Literature : Jordan & Evermann (1896); Rivas (1966); Anderson (1967); Fischer (ed.) (1978).

Remarks : This species is sometimes implicated in cases of ciguatera fish poisoning.

Macolor Bleeker, 1860

LUT Mac

Genus : Macolor Bleeker, 1860:25. Type-species Macolor typus Bleeker, 1867 (= Macolor niger (Forsskål, 1775)), by original designation.

Synonyms : Genus Promblys Gill, 1862.

Diagnostic Features : Medium-sized snappers with an oblong, relatively deep body. Mouth relatively large, protractile; a row of pointed, conical teeth in jaws, enlarged anteriorly, and inner bands of villiform teeth on sides of upper jaw and at front of lower jaw; vomerine tooth patch broadly V-shaped, without a median posterior extension; gill rakers very numerous, about 60 to 80 on lower limb of first gill arch; a deep notch on lower edge of preopercle. Dorsal fin continuous, not notched at junction of spinous and soft portions, with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 10 or 11 soft rays; pectoral fins relatively elongate, about equal to head length in adults; dorsal and anal fins scaled; caudal fin emarginate. Colour: adults mainly blackish except lighter on belly, sometimes with undulating dark lines on head; juveniles with a strongly contrasted pattern of mainly black dorsally and white ventrally, with white spots in black region of back and a black band through the eye.

Biology, Habitat and Distribution : Macolor species are conspicuous inhabitants of coral reef areas, the adults occurring both solitary and in groups. Juveniles are often seen in the vicinity of crinoids (feather stars). The depth range is generally between about 5 and 40 m, but specimens have been reported to 90 m. The diet includes mainly fishes and crustaceans.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from Samoa to East Africa, and from the Ryukyu Islands southward to Australia.

Interest to Fisheries : Macolor species are frequently seen in markets, but seldom in large quantities. The flesh is of good quality and generally marketed fresh.

Key to the species of Macolor :

1a. Soft dorsal fin rays usually 14 (last ray divided at base); soft anal fin rays usually 11 (last ray divided at base); gill rakers on lower limb of first arch 60 to 70; juveniles without broad, black horizontal band from eye to rear edge of opercle, and with short pelvic fins (shorter than head length) ..... **M. niger**

1b. Soft dorsal fin rays usually 13 (last ray divided at base); soft anal fin rays usually 10 (last ray divided at base); gill rakers on lower limb of first arch 70 to 80; juveniles with a broad, black horizontal band from eye to rear edge of opercle, and with extremely elongate pelvic fins (much longer than head length) ..... **M. macularis**

Macolor macularis Fowler, 1931

LUT Mac 2

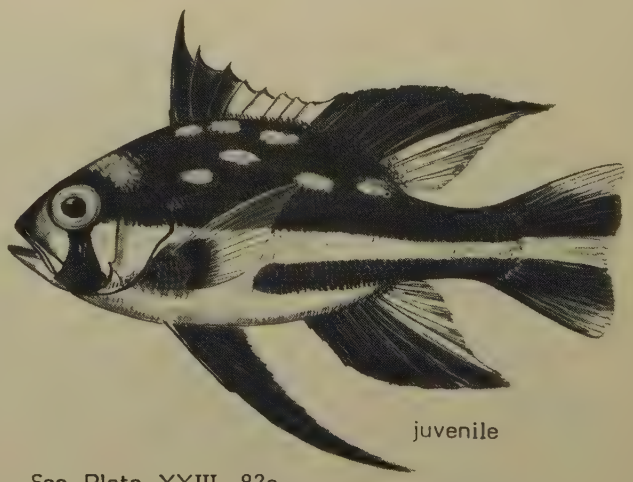
Macolor macularis Fowler, 1931, Bull.U.S.Nat.Mus., 100, Vol. II:181 (Philippine Islands).

Synonyms : None.

FAO Names : En - Midnight snapper; Fr - Vivaneau minuit; Sp - Pargo medianoche.

See Plate XXIII, 82

Diagnostic Features : Body relatively deep. Head profile markedly convex; preorbital bone broader than eye diameter; mouth large, the maxilla extending to below anterior half of eye; a deep notch on lower edge of preopercle; a row of conical teeth in jaws, enlarged anteriorly and inner bands of villiform teeth on sides of upper jaw and front of lower jaw; vomerine tooth patch broadly V-shaped; gill rakers on lower limb of first arch (including rudiments about 70 to 80. Dorsal fin with 10 spines and 13 soft rays; anal fin with 3 spines and 10 soft rays; posterior lobes of dorsal and anal fins distinctly pointed; pectoral fins long, reaching level of anus, with 17 or 18 rays; caudal fin emarginate;



juvenile

See Plate XXIII, 82a

juveniles (less than about 20 cm standard length) with greatly elongate pelvic fins. Scales moderate-sized, about 50 to 56 in lateral line. Scale rows on back parallel to lateral line. Colour: adults uniformly blackish with a yellow iris; juveniles under 20 cm total length black on upper sides (usually with 6 to 10 small white spots) and white below, a black bar through eye and a broad, black horizontal band from eye to rear edge of opercle, pale pectoral fins (except base) and a black stripe from pectoral region to lower caudal lobe; larger juveniles with about 6 to 10 white spots on back.

Geographical Distribution : Tropical western Pacific Ocean from the Ryukyu Islands southward to Australia and Melanesia. Possibly more widespread, but confused in the literature with M. niger.

Habitat and Biology : Inhabits coral reefs and is usually seen solitarily. Occurs at depths between about 5 and 50 m. Feeds largely on fishes and crustaceans.

Size : Probably similar to M. niger (maximum total length about 60 cm).

Interest to Fisheries : Frequently seen in markets, mainly fresh. Caught with handlines, gill nets, traps, and also speared by divers.

Local Names : -

Literature : Masuda et al. (1984, as M. niger).

Remarks : Fowler (1931) described Macolor macularis from a series of 26 specimens, 35-615 mm total length collected in the Philippines. He distinguished it from M. niger on the basis of colour pattern (mainly dark compared to the black and white contrasting colours of M. niger). He apparently did not realize that the adult stage of M. niger was also primarily dark. On the basis of Fowler's meristic characters (primarily those pertaining to dorsal and anal fin-ray counts and gill raker counts) it appears that his material included both M. niger and M. macularis. Unfortunately, separate counts and measurements were not given for the holotype (U.S. National Museum reg. no. 89996). According to Dr V.C. Springer (pers. comm.) the holotype has been missing for several years. Therefore it is impossible to assess the taxonomic status of M. macularis. Adult specimens have not been examined in detail, but juveniles of M. macularis are clearly separable from M. niger on the basis of colour pattern (see colour illustrations) and the meristic features given in the key to Macolor species. Counts for the neotype are as follows: dorsal fin spines 10, soft rays 13; anal fin spines 3, soft rays 10; pectoral fin rays 17; gill rakers on lower limb of first arch 71. The pelvic fins are greatly elongated (39% of standard length).

In addition to the holotype, several juveniles specimens of M. macularis from the East Indian collection of P. Bleeker were examined at the Rijkmuseum van Natuurlijke Historie (Leiden). These are contained in a mixed lot with M. niger, including the probable holotype of Macolor typus Bleeker (RMNH reg. no. 27708). The holotype of Diacope macolor (Muséum d'Histoire Naturelle, Paris; reg. no. 8172) was also examined. The holotypes of both D. macolor and M. typus were identified as M. niger. The Forsskål type of Sciaena niger was not examined, but the author has seen specimens from Saudi Arabia (Red Sea), the type locality. Professor Bruno Condé (l'Université de la Ville de Nancy, France), and Dr W.E. Burgess (T.F.H. Publications, New Jersey, USA), first brought the existence of this species to my attention. It will be described in more detail in a forthcoming review of Macolor now in progress by Amaoka and Hishimoto.

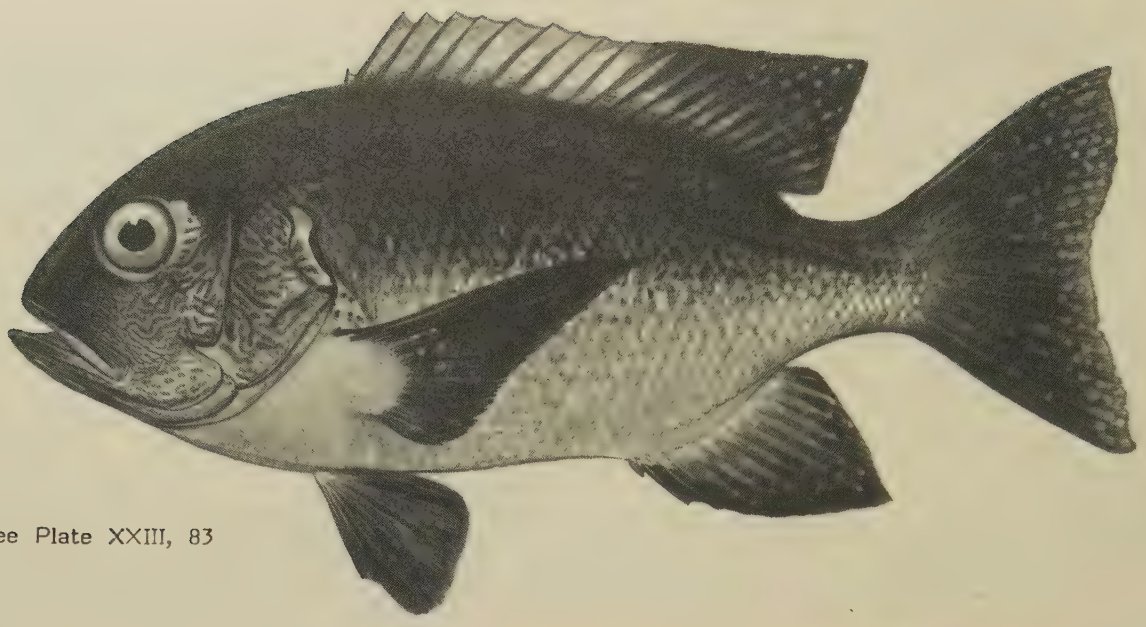
Macolor niger (Forsskål, 1775)

LUT Mac 1

Sciaena nigra Forsskål, 1775, Descrip.Animal.:xi, 47 (Djedda, Red Sea).

Synonyms : (From Fowler, 1931) Diacope macolor Lesson (1827); Macolor typus Bleeker (1867); ? Macolor macularis Fowler (1931).

FAO Names : En - Black and white snapper; Fr - Vivaneau plate; Sp - Pargo blanco y negro.



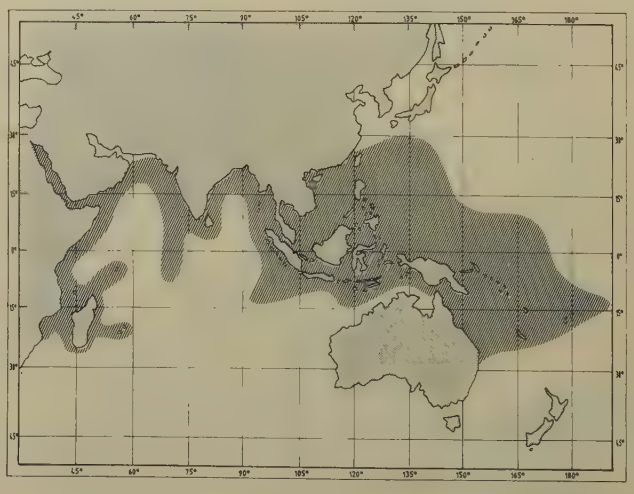
See Plate XXIII, 83

juvenile

See Plate XXIII, 83a

Diagnostic Features : Body relatively deep. Head profile markedly convex; preorbital bone broader than eye diameter; mouth large, the maxilla extending to below anterior half of eye; a deep notch on lower edge of preopercle; a row of conical teeth in jaws, enlarged anteriorly and inner bands of villiform teeth on sides of upper jaw and front of lower jaw; vomerine tooth patch broadly V-shaped; gill rakers on lower limb of first arch (including rudiments about 60 to 70. Dorsal fin with 10 spines and 14 soft rays; anal fin with 3 spines and 11 soft rays; posterior lobes of dorsal and anal fins distinctly pointed; pectoral fins long, reaching level of anus, with 17 or 18 rays; caudal fin emarginate. Scales moderate-sized, about 50 to 56 in lateral line. Scale rows on back parallel to lateral line. Colour: adults uniformly blackish with a yellow iris; juveniles under 20 cm total length black on upper sides and white below, with a black bar through eye, black pectoral fins and a black stripe from pectoral region to lower caudal lobe; larger juveniles with 3 to 6 white spots on back.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from Samoa to East Africa, and from the Ryukyu Islands southward to Australia.



Habitat and Biology : Inhabits coral reefs and is usually seen solitarily. Occurs at depths between about 5 and 90 m. Feeds largely on fishes and crustaceans.

Size : Maximum total length about 60 cm; common to 35 cm.

Interest to Fisheries : Frequently seen in markets, mainly fresh. Caught with handlines, gill nets, traps, and also speared by divers.

Local Names : JAPAN: Nadaratarumi; NEW CALEDONIA: Perche blanche et noire; PALAU: Ngkalalk; SAMOA: Matala'oa; SOUTH AFRICA: Black beauty, Swartnooi; THE PHILIPPINES: Kanu, Maya-maya.

Literature : Fowler (1931); Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Ocyurus Gill, 1862

LUT Ocyur

Genus : Ocyurus Gill, 1862:236. Type-species Sparus chrysurus Bloch, 1790, by original designation.

Synonyms : None.

A single species in the genus - see Ocyurus chrysurus.

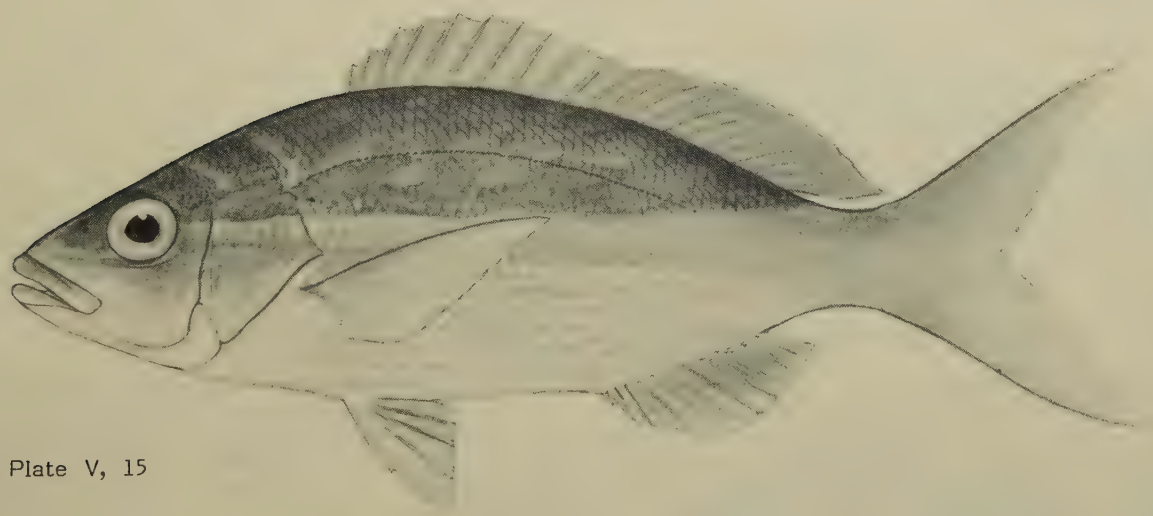
Ocyurus chrysurus (Bloch, 1790)

LUT Ocyur 1

Sparus chrysurus Bloch, 1790, Ichth., Pl. 262 (Brazil).

Synonyms : Anthias rabirubia Bloch & Schneider (1801); Sparus semiluna Lacepède (1803); Mesoprion aurovittatus Agassiz (1829); Ocyurus rijgersmoei Cope (1871); Lutjanus melanurus Jordan & Gilbert (1883).

FAO Names : En - Yellowtail snapper; Fr - Vivaneau queue jaune; Sp - Rabirubia.



See Plate V, 15

Diagnostic Features : Body slender (greatest depth about 2.9 to 3.3 times in standard length). Head relatively small, lower jaw projecting slightly beyond the upper; canine teeth in jaws small; vomerine tooth patch V-shaped, with a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 21 or 22. Dorsal fin with 10 spines and 12 to 14 (usually 12) soft rays; anal fin with 3 spines and 9 (rarely 8) soft rays; pectoral fins with 15 or 16 rays; caudal fin deeply forked. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides blue to violet with scattered yellow spots, unequel in size; a prominent midlateral yellow band from snout to caudal fin base, gradually broader posteriorly; lower sides and belly whitish with narrow reddish and yellow stripes; dorsal and caudal fins yellow; anal and pelvic fins whitish.

Geographical Distribution : Tropical western Atlantic Ocean, extending northward to Massachusetts and southward to southeastern Brazil. Rare north of the Carolinas. Most common in the Bahamas, off south Florida and throughout the Caribbean.

Habitat and Biology : Inhabits coastal waters at depths between about 10 and 70 m, mostly around coral reefs. Usually seen well above the bottom, frequently in aggregations. Young fish are usually found over weed beds. Adults feed on a combination of plankton and benthic animals including fishes, crustaceans, worms, gastropods and cephalopods. The young are zooplankton feeders. At Jamaica spawning occurs over most of the year with peak activity from January to April and from August to October. In the Florida Keys the season is April to August. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.16 and 0.20 respectively for the Cuban population (Piedra, 1965). Estimated maximum age: 6 to 14 years.

Size : Maximum total length about 70 cm; common to 40 cm. Matures at about 25 to 30 cm.

Interest to Fisheries : Of interest to commercial and sport fisheries. Along with Lutjanus synagris it is taken more frequently than other lutjanids in shallow insular waters of the Caribbean. Caught mainly with beach seines and trammel nets; also taken with traps, handlines and bottom longlines. A total catch of 5 178 metric tons was reported to FAO from Fishing Areas 31 and 41 in 1983. The flesh is highly esteemed. Marketed mostly fresh, but also frozen.

Local Names : BRAZIL: Cioba; CUBA: Rabirrubia; MARTINIQUE: Colas, Sarde queue jaune; VENEZUELA: Rabirrubia.

Literature : Jordan & Evermann (1896); Anderson (1967); Randall (1968); Fischer (ed.) (1978).

Paracaesio Bleeker, 1875

LUT Para

Genus : Paracaesio Bleeker, 1875:38, 92. Type-species Caesio xanthurus Bleeker, 1868, by monotypy.

Synonyms : Genus Vegetichthys Tanaka (1917); Genus Aetiasis Barnard (1937).

Diagnostic Features : Medium-sized snappers with fusiform bodies, relatively slender and elongate, often robust. Jaws with an outer series of well developed canine teeth, larger anteriorly and with an inner band of villiform teeth; vomerine tooth patch V-shaped or crescentic, without a medial posterior extension; interorbital space convex. Dorsal fin continuous, not incised near junction of spinous and soft portions, with 10 spines and 10 (rarely 9 or 11) soft rays; anal fin with 3 spines and 8 (rarely 9) soft rays; dorsal and anal fins scaleless; pectoral fins long, from about equal to head length to significantly longer than head, with 16 or 17 rays; caudal fin emarginate to forked. Scales medium-sized to relatively small, about 47 to 73 in lateral line; maxilla with or without scales. Colour: bluish, purplish-brown or brown on back and upper sides; lighter below, often silvery or whitish; sometimes with a yellowish band on upper back or a series of broad, dark bars on sides.

Biology, Habitat and Distribution : Inhabits relatively shallow to moderately deep water (about 20 to 250 m depth), usually over rocky bottoms. They occur solitarily or in small to large schools, swimming well above the bottom. The diet consists largely of zooplankton.

Geographical Distribution : Inshore tropical Indo-West Pacific.

Interest to Fisheries : Paracaesio are important foodfishes in many areas. Paracaesio xanthurus, in particular, is commonly encountered in markets. These fishes are mainly caught with handlines and bottom longlines. Usually offered fresh.

Key to the species of Paracaesio :

Scales small, about 68 to 73 in lateral line; caudal fin deeply forked

2a. Length of caudal fin about 2.3 to 2.5 times in standard length; back blue to purplish-brown without an extensive yellow area ..... **P. sordidus** (Fig. 1)

2b. Length of caudal fin about 2.6 to 2.8 in standard length; back covered with a broad yellow area from forehead to caudal fin base ..... **P. xanthurus** (Fig. 2)

Scales larger, about 47 to 50 in lateral line; caudal fin nearly truncate to moderately forked

3a. Maxilla scaled; back with 4 brownish bars ..... **P. kusakarii** (Fig. 3)

3b. Maxilla scaleless; back with 5 to 8 dark bars or uniform

4a. Upper sides with 5 relatively distinct brownish bars; lower gill rakers (including rudiments) 17 or 18 ..... **P. stonei** (Fig. 4)

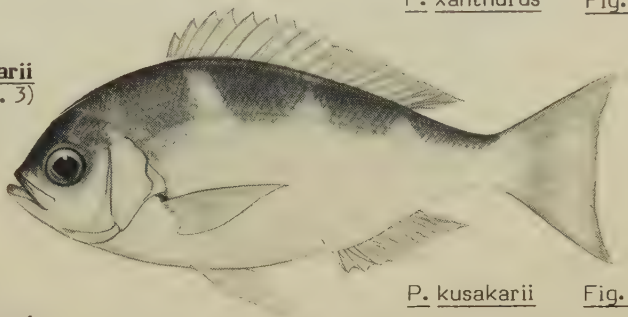
4b. Upper sides without bars or with 8 faint bars; lower gill rakers 18 to 20

5a. Back with a diagonal band of yellow from upper edge of gill cover to last dorsal spine; sometimes with 8 faint bars on side ..... **P. gonzalesi** (Fig. 5)

5b. Back uniform blue without a diagonal band or vertical bars ..... **P. caeruleus** (Fig. 6)

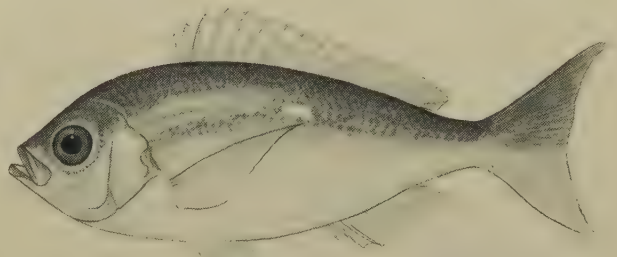
P. sordidus Fig. 1

P. xanthurus Fig. 2

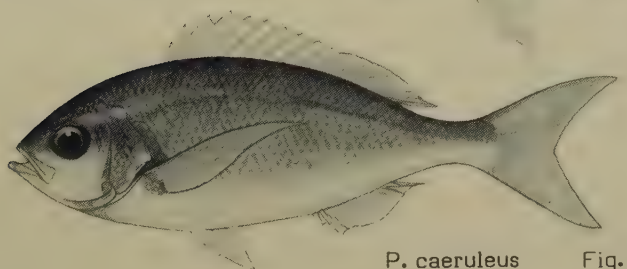


P. kusakarii Fig. 3

P. stonei Fig. 4



P. gonzalesi Fig. 5



P. caeruleus Fig. 6

Paracaesio caeruleus (Katayama, 1934)

LUT Para 2

Vegetichthys caeruleus Katayama, 1934, Proc.Imp.Acad.Tokyo, 10:436 (Hatizyo Island, Idu, Japan).

Synonyms : None.

FAO Names : En - Japanese snapper; Fr - Vivanette japonaise; Sp - Panchote japonés.

See Plate XXIII, 84

Diagnostic Features : Body moderately slender, fusiform. Eye large, about 3.1 to 3.4 times in head length; snout short, about equal to, or shorter than eye diameter; interorbital space convex; upper and lower jaws about equal, with small villiform teeth in bands; maxilla scaleless; gill rakers on lower limb of first arch (including rudiments) 19 or 20. Dorsal fin with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 rays; caudal fin moderately forked or lunate. Scales moderate-sized, about 47 to 50 in lateral line. Scale rows on back parallel to lateral line. Colour: back and sides overall blue; whitish or silvery on belly and lower part of head; dorsal and caudal fins pale yellow; other fins whitish or translucent.

Geographical Distribution : Known only from southern Japan.

Habitat and Biology : Occurs over rocky bottoms at depths exceeding 100 m.

Size : Maximum total length about 50 cm; common to 30 cm.

Interest to Fisheries : An important foodfish often seen in markets. Caught mainly with handlines and bottom longlines. Marketed fresh.

Local Names : JAPAN: Aodai.

Literature : Lee (1982); Masuda et al. (1984).

Paracaesio gonzalesi Fourmanoir & Rivaton, 1979

LUT Para 3

Paracaesio gonzalesi Fourmanoir & Rivaton, 1979, Cahiers de l'Indo-Pacifique, 1:405 (New Hebrides).

Synonyms : None.

FAO Names : En - Vanuatu snapper; Fr - Vivanette vanuatu; Sp - Panchote vanuatú.

See Plate XXIII, 85

Diagnostic Features : Body moderately elongate, fusiform (greatest depth about 2.6 to 2.7 times in standard length). Eye large, snout short, about equal to, or shorter than eye diameter; interorbital space convex; lower jaw protruding slightly; both jaws with an outer series of well-developed canines, larger anteriorly and with an inner band of small villiform teeth; maxilla scaleless; gill rakers on lower limb of first arch (including rudiments) 18 to 20. Dorsal fin with 10 spines and 9 or 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 rays; caudal fin forked. Scales moderate-sized, about 48 to 50 in lateral line. Colour: back and upper sides light brown; silvery white on lower sides and belly; a yellow band running diagonally from beginning of lateral line to last dorsal spine; sometimes with 8 vertical bars on side.

Geographical Distribution : Tropical western Pacific Ocean. Known only from the Fiji Islands, Vanuatu, and the Philippines, but probably more widespread.

Habitat and Biology : Occurs over rocky bottoms at depths between about 140 and 250 m.

Size : Maximum total length about 50 cm.

Interest to Fisheries : Of potential interest to fisheries as the flesh is of good quality. Presently caught in small numbers, mainly with handlines. Marketed fresh.

Local Names : -

Literature : Fourmanoir & Rivaton (1979); Raj & Seeto (1983).

Paracaesio kusakarii Abe, 1960

LUT Para 4

Paracaesio kusakarii Abe, 1960, Japan.J.Ichthyol., 8:56 (Japan).

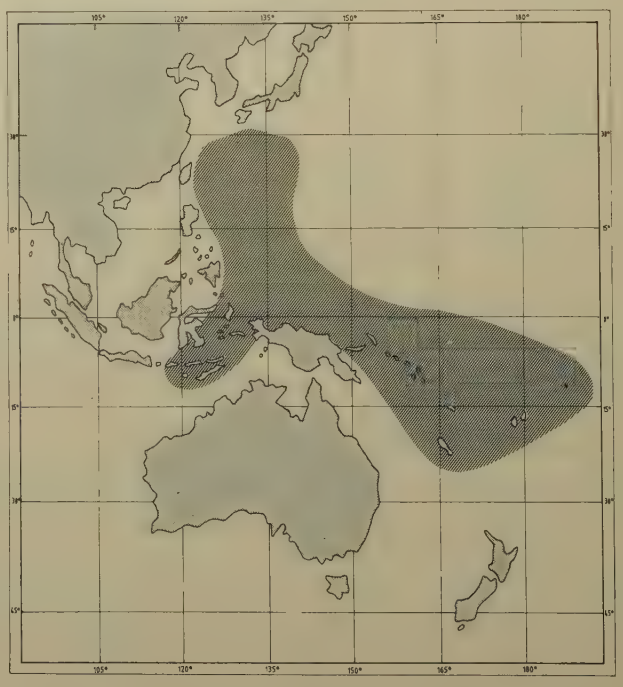
Synonyms : None.

FAO Names : En - Saddle-back snapper; Fr - Vivanette sellée; Sp - Panchote sillevo.

See Plate XXIV, 86

Diagnostic Features : Body moderately deep. Eye large, about 3.6 times in head length; snout short (shorter than eye diameter); interorbital space convex; large specimens developing a hump on forehead; lower jaw protruding slightly; both jaws with an outer series of well-developed canine-teeth, larger anteriorly, and an inner series of small villiform teeth in bands; maxilla scaled; gill rakers on lower limb of first arch (including rudiments) 17. Dorsal fin with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 rays; caudal fin emarginate. Scales moderate-sized, about 48 to 50 in lateral line. Scale rows on back parallel to lateral line. Colour: back and upper sides light brown; remainder of head and body silvery white with 4 broad, vertical bars on upper side; fins greyish, whitish, or slightly yellow.

Geographical Distribution : Western Pacific Ocean from Samoa to the Ryukyu and Ogasawara Islands (Japan) and southward to New Caledonia.



Habitat and Biology : Occurs over rocky bottoms at depths between about 100 and 200 m.

Size : Maximum total length about 60 cm.

Interest to Fisheries : Of potential interest to fisheries, but presently caught in small numbers, mainly with handlines. Marketed fresh.

Local Names : JAPAN: Shima-aodai; SAMOA: Palu-tuauli.

Literature : Lee (1982); Raj & Seeto (1983); Masuda et al. (1984).

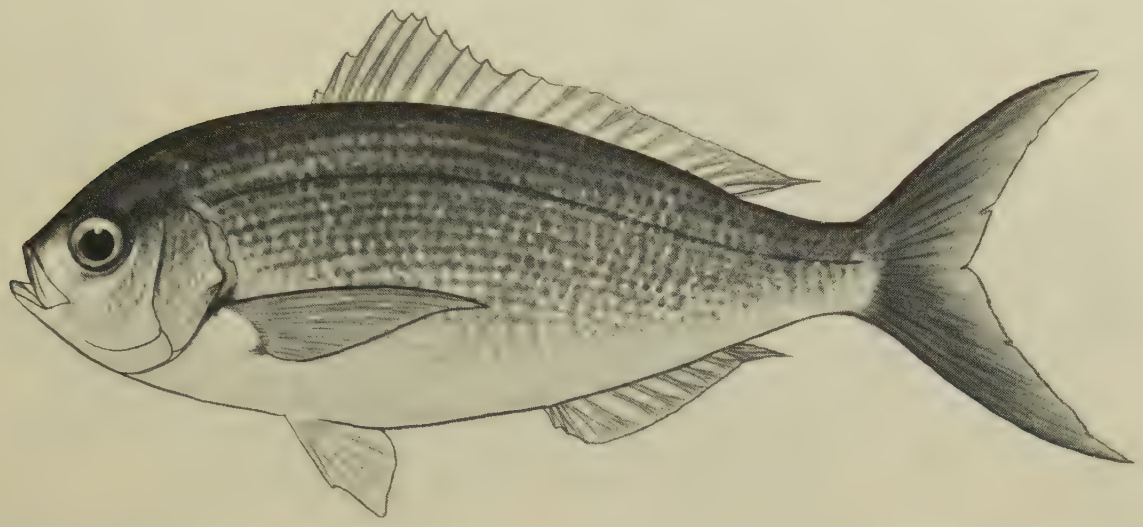
Paracaesio sordidus Abe & Shinohara, 1962

LUT Para 5

Paracaesio sordidus Abe & Shinohara, 1962, Japan.J.Ichth., 9:56 (Japan).

Synonyms : None.

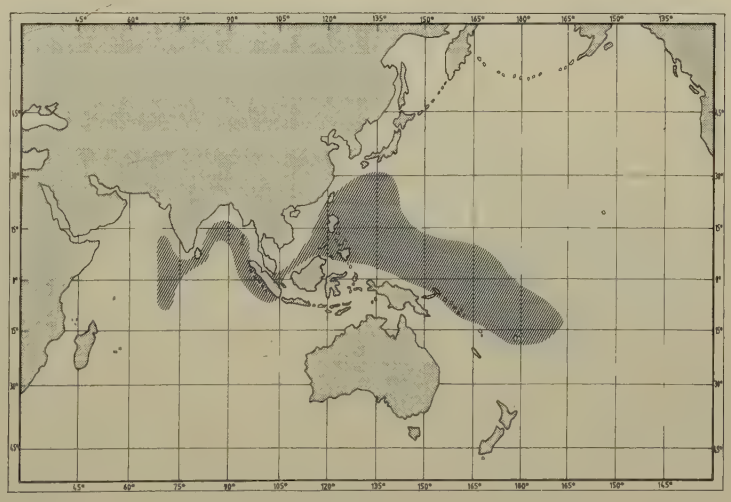
FAO Names : En - Blue snapper; Fr - Vivanette bleu; Sp - Panchote azul.



See Plate XXIV, 87

Diagnostic Features : Body moderately deep, fusiform (greatest depth about 2.5 times in standard length). Eye large; snout short, about equal to, or shorter than eye diameter; interorbital space convex; upper and lower jaws about equal; both jaws with an outer series of well developed canine teeth and an inner band of small villiform teeth; maxilla scaleless; gill rakers on lower limb of first arch (including rudiments) 19 to 22. Dorsal fin with 10 spines and 9 or 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 or 17 rays; caudal fin deeply forked. Scales small, about 68 to 73 in lateral line. Scale rows on back parallel to lateral line. Colour: overall dark purplish-brown to bluish; silvery or whitish on lower sides and belly; dorsal and caudal fins brownish to slightly yellow, other fins whitish to translucent.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific from Samoa to the Laccadive Islands and Chagos Archipelago; ranging northward to the Ryukyu Islands.



Habitat and Biology : Occurs over rocky bottoms between about 100 and 200 m

Size : Maximum total length about 40 cm.

Interest to Fisheries : An important foodfish in some areas, but caught in relatively low numbers, mainly with handlines. Usually marketed fresh.

Local Names : JAPAN: Yogore-aodai; THE PHILIPPINES: Sagision.

Literature : Kyushin et al. (1977); Masuda et al. (1984).

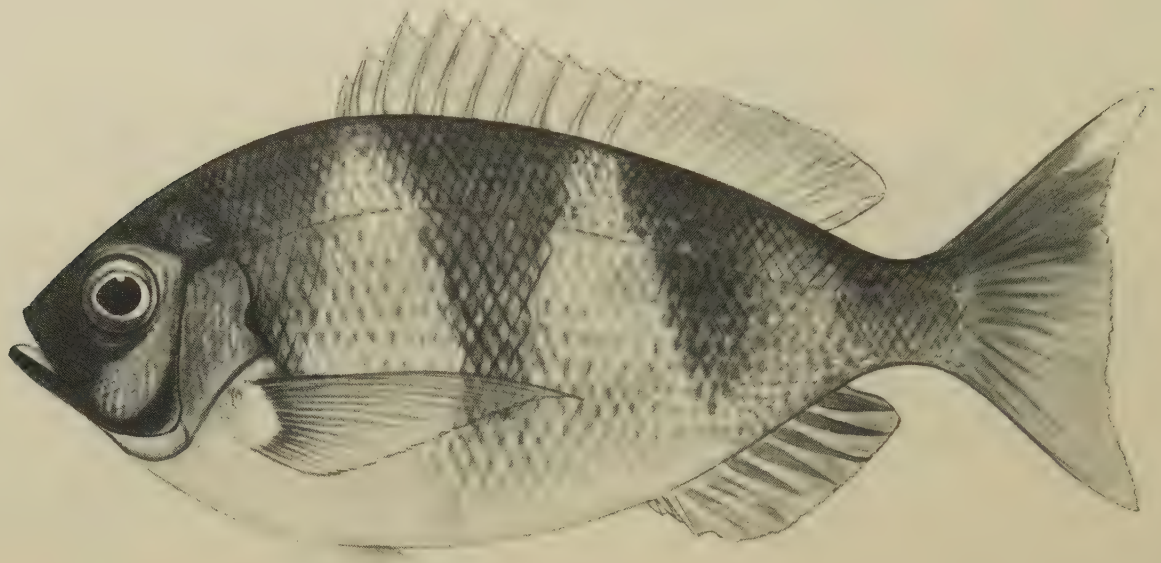
Paracaesio stonei Raj & Seeto, 1983

LUT Para 6

Paracaesio stonei Raj & Seeto, 1983, Copeia (2):450 (Beqa Island, Fiji Islands).

Synonyms : None.

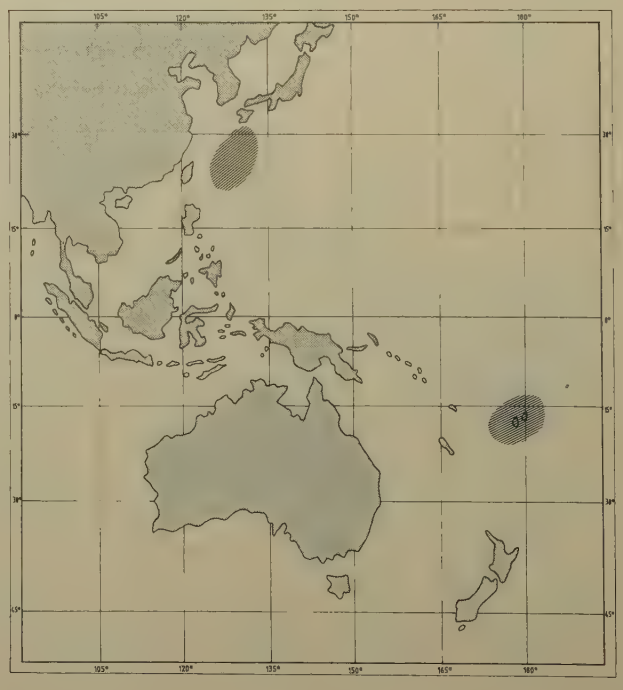
FAO Names : En - Cocoa snapper; Fr - Vivanette cacao; Sp - Panchote cacao.



See Plate XXIV, 88

Diagnostic Features : Body moderately deep. Eye large, about 8.6 to 9.3% of standard length; snout short (shorter than eye diameter); interorbital space slightly convex; lower jaw protruding slightly; both jaws with an outer series of well developed canine teeth, larger anteriorly, and an inner band of small villiform teeth; maxilla scaleless; gill rakers on lower limb of first arch (including rudiments) 17 or 18. Dorsal fin with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 rays; caudal fin emarginate. Scales moderate-sized, about 48 to 50 in lateral line. Scale rows on back parallel to lateral line. Colour: back and upper sides light brown, silvery on lower sides and belly; 5 brown, vertical bars on upper side; fins grey to whitish except margin of dorsal fin and most of caudal fin yellow.

Geographical Distribution : Known thus far only from the Fiji and Ryukyu Islands but probably more widespread.



Habitat and Biology : The two known specimens were captured at a depth of 220 m.

Size : Maximum total length of at least 50 cm.

Interest to Fisheries : Of potential interest to fisheries if sufficient stocks can be located. The flesh is of good quality. Caught with deep handlines.

Local Names : JAPAN: Yanbaru-shima-aodai; SAMOA: Palu-mutu.

Literature : Raj & Seeto (1983); Masuda et al. (1984).

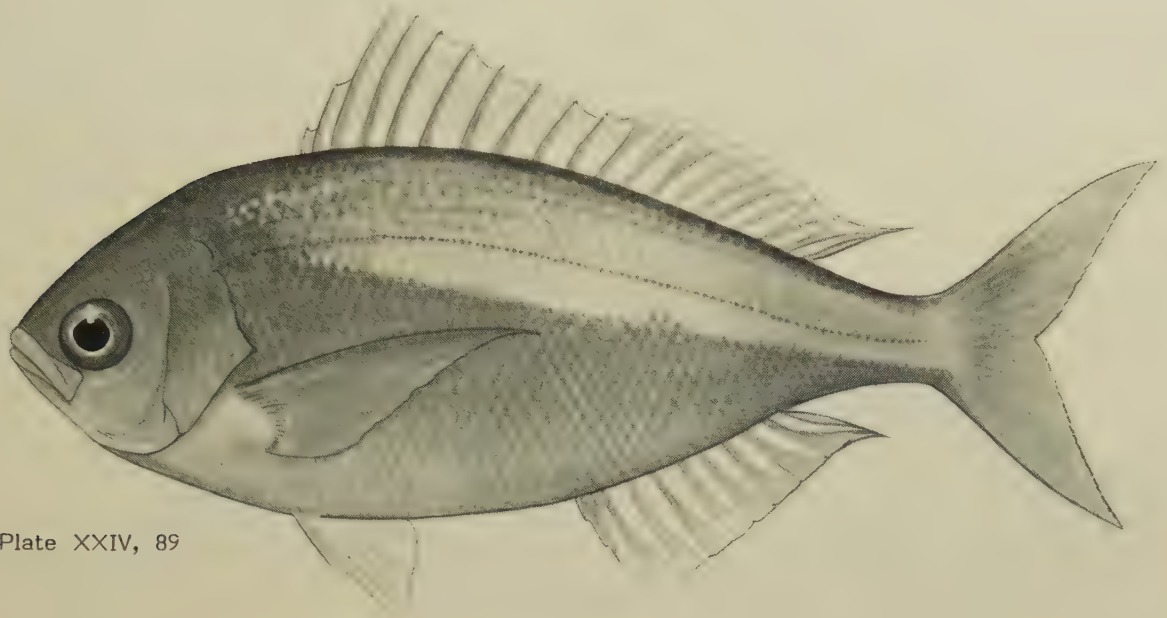
Paracaesio xanthurus (Bleeker, 1869)

LUT Para 1

Caesio xanthurus Bleeker, 1869, Versl.Kon.Akad.Wet.Amsterdam, ser. 2, 3:78 (Madagascar).

Synonyms : Paracaesio pedleyi Mcculloch & Waite (1916); Vegetichthys tumidus Tanaka (1917); Aetiasis cantharoides Barnard (1937).

FAO Names : En - Yellowtail blue snapper; Fr - Vivanette queue jaune; Sp - Panchote rabo amarillo.



See Plate XXIV, 89

Diagnostic Features : Body moderately deep, fusiform. Eye large, about 3.5 times in head length; snout short, about equal to , or shorter than eye diameter; interorbital space convex; upper and lower jaws about equal; both jaws with an outer series of well developed canine teeth and an inner band of small villiform teeth; maxilla with or without scales; gill rakers on lower limb of first arch (including rudiments) 18 to 20. Dorsal fin with 10 spines and 10 (rarely 11) soft rays; anal fin with 3 spines and 8 (rarely 9) soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 rays; caudal fin deeply forked. Scales small, about 70 to 72 in lateral line. Scale rows on back parallel to lateral line. Colour: overall blue, sometimes whitish on belly and lower part of head; a bright yellow area on back extending from forehead to base of caudal fin; dorsal and caudal fins yellow, other fins whitish or translucent.

Geographical Distribution : Widely distributed in the tropical and subtropical Indo-Pacific Ocean from Samoa to East Africa, and from southeastern Australia northward to southern Japan.

Habitat and Biology : Occurs over rocky bottoms, sometimes forming large schools at depths between about 20 and 150 m. Feeds largely on zooplankton.

Size : Maximum total length about 40 cm.

Interest to Fisheries : A useful foodfish in some areas. Caught mainly with handlines and bottom long-lines. Marketed fresh or frozen.

Local Names : AUSTRALIA: Southern fusilier; JAPAN: Umeiro; SAMOA: Palu-tuasama; SOUTH AFRICA: Geelstert-piesang, Yellowtail fusilier.

Literature : Fowler (1931); Smith (1949); Masuda et al. (1984).

Parapristipomoides Kami, 1973b

LUT Paraprist

Genus : Parapristipomoides Kami, 1973b:557. Type-species: Pristipomoides squamimaxillaris Kami, 1973b, by original designation.

A single species in the genus - see Parapristipomoides squamimaxillaris.

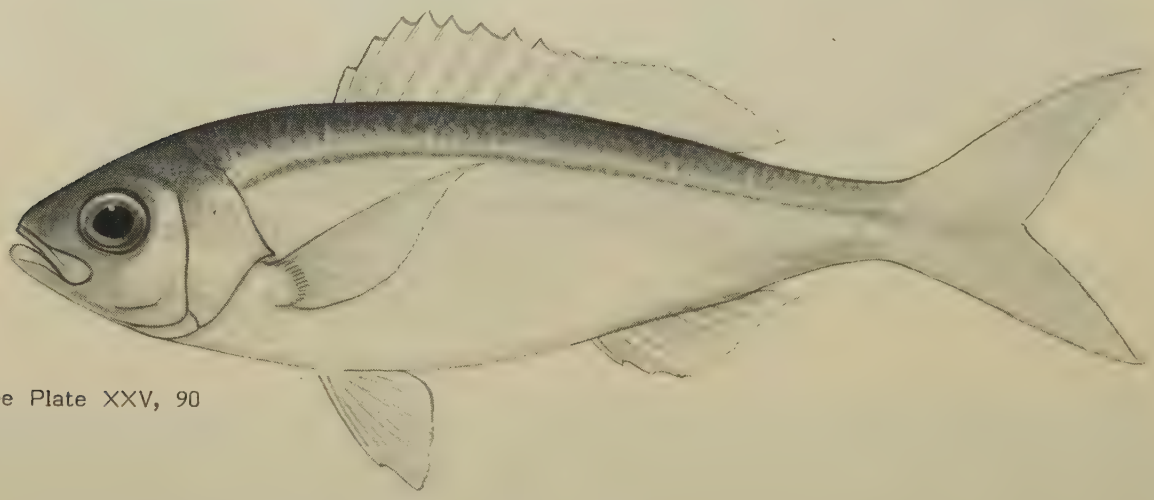
Parapristipomoides squamimaxillaris (Kami, 1973b)

LUT Paraprist 1

Pristipomoides squamimaxillaris Kami, 1973b, Copeia, no. 3:557 (Easter Island).

Synonyms : None.

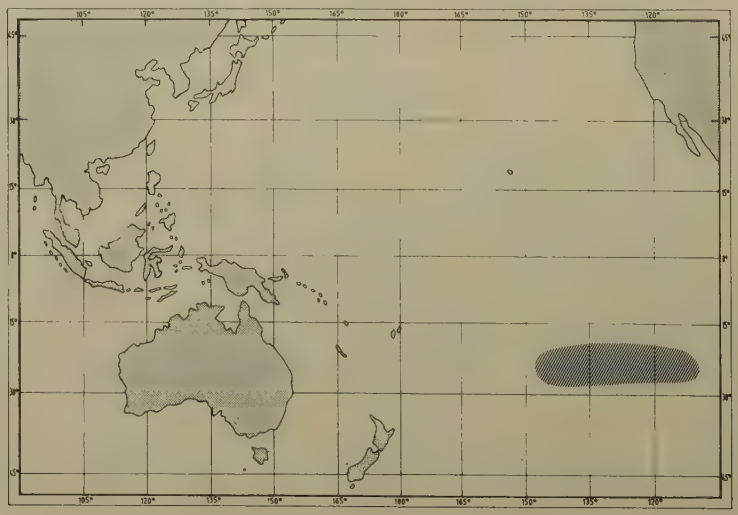
FAO Names : En - Scalemouth jobfish; Fr - Colas écailleuse; Sp - Panchito escamudo.



See Plate XXV, 90

Diagnostic Features : Body slender, elongate (greatest depth about 28 to 33% of standard length). Head relatively small; interorbital space slightly convex; snout somewhat pointed, the lower jaw protruding slightly; jaws extending to below front part of pupil; maxilla scaled; both jaws with a single, narrow band of villiform teeth; no canines present; vomerine tooth patch small and oval-shaped; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 20 to 24; total rakers on first arch 32 to 35. Dorsal fin with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus, with 16 rays; caudal fin deeply forked. Scales moderate-sized about 55 to 58 in lateral line; scale rows on back parallel to lateral line. Colour: silvery pink, darker pink on back and upper sides; caudal fin yellow, other fins whitish to slightly pink.

Geographical Distribution : South-eastern Oceania; thus far known only from Easter Island and Rapa.



Habitat and Biology : Occurs over rocky bottoms from about 130 m to at least 460 m depth.

Size : Maximum total length about 50 cm.

Interest to Fisheries : Caught regularly by deep handlining at Easter Island and Rapa. Marketed fresh.

Local Names : -

Literature : Kami (1973b).

Pinjalo Bleeker, 1845

LUT Pinj

Genus : Pinjalo Bleeker, 1847:521. Type-species Pinjalo typus Bleeker, 1845, by monotypy.

Synonyms : None.

Diagnostic Features : Medium-sized snappers with robust, moderately deep body. Head relatively small, snout pointed, interorbital space strongly convex, preorbital bone narrow; eye situated in centre of head. Teeth in jaws small, no canines; vomer and palatines with minute teeth; premaxillae protractile; gill openings not extending far anterior to front border or eye. Dorsal fin continuous, not incised near junction of spinous and soft portions, with 11 or 12 spines and 13 or 14 soft rays; anal fin with 3 spines and 9 or 10 soft rays; pectoral fins long, reaching level of anus, with 17 or 18 rays; caudal fin emarginate. Scales moderate-sized, about 47 to 52 in lateral line, and 58 to 62 in lateral series above the lateral line. Colour: pink or red on back, whitish or silvery on lower sides and belly; fins reddish, pink, yellow, or whitish, often with narrow blackish margins.

Biology, Habitat and Distribution : Inhabits reefs and rocky bottoms to depths of about 60 m. Feeds on benthic and planktonic invertebrates, and possibly small fishes.

Geographical Distribution : Inshore waters of the tropical Indo-West Pacific.

Interest to Fisheries : Pinjalo species are important in certain artisanal fisheries and of potential interest on a more widespread basis. Mainly taken with handlines, traps and bottom trawls. The flesh is of good quality and generally marketed fresh.

Key to the species of Pinjalo :

1a. Dorsal spines 11, dorsal soft rays usually 14; anal soft rays usually 10; pelvic and anal fins yellow in life; no white spot on upper half of caudal peduncle ..... **P. pinjalo**

1b. Dorsal spines 12, dorsal soft rays 13; anal soft rays 9; pelvic and anal fins pink or whitish in life; a white spot on upper half of caudal peduncle (may be absent in preservative) ..... **Pinjalo** sp.

Pinjalo pinjalo (Bleeker, 1850)

LUT Pinj 1

Caesio pinjalo Bleeker, 1850, Verh.Batav.Genootsch.(Maenoid.), 23:10 (Batavia).

Synonyms : (From Fowler, 1931) Mesoprion mitchelli Günther (1867).

FAO Names : En - Pinjalo; Fr - Pinjalo; Sp - Pinjalo.

See Plate XXV, 91

Diagnostic Features : Body moderately deep. Dorsal profile of head high; interorbital space strongly convex; eye relatively large (about equal to snout length or greater), with an adipose eyelid; preorbital bone narrow, less than eye diameter; snout relatively short and pointed; mouth small, the maxilla reaching below front of eye; a single row of small, conical teeth in jaws, enlarged anteriorly, and an inner band of villiform teeth; gill rakers on lower limb of first arch (including rudiments) 15 to 17. Dorsal fin with 11 spines and 14 soft rays; anal fin with 3 spines and 10 soft rays; both fins with a scaly sheath at base; pectoral fins long, reaching level of anus, with 18 rays; caudal fin emarginate. Scales moderate-sized, about 47 to 52 in lateral line; predorsal scales on top of head beginning above middle of eye; scale rows above and below lateral line rising obliquely toward dorsal profile. Colour: pink or red; whitish or silvery on lower sides and belly; dorsal, anal, caudal and pelvic fins frequently with black margin; pelvic and anal fins yellowish.

Geographical Distribution : Tropical western Pacific and Indian Oceans from New Guinea to East Africa and northward to Taiwan Island.

Habitat and Biology : Inhabits reefs and rocky bottoms to depths of about 60 m. Feeds on benthic and planktonic invertebrates, and possibly small fishes.

Size : Maximum total length about 50 cm; common to 30 cm.

Interest to Fisheries : Of potential interest to fisheries, but caught in relatively small amounts. Mainly taken with handlines, traps and bottom trawls. Marketed fresh or dried-salted.

Local Names : THE PHILIPPINES: Bilason, Manul.

Literature : Fowler (1931); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984).

Remarks : Frequently confused with Pinjalo sp. (see description below). High lateral line counts (60 to 68) have been reported for Pinjalo species, but are probably erroneus. Counts in this range are typical for the longitudinal row of scales immediately above the lateral line.

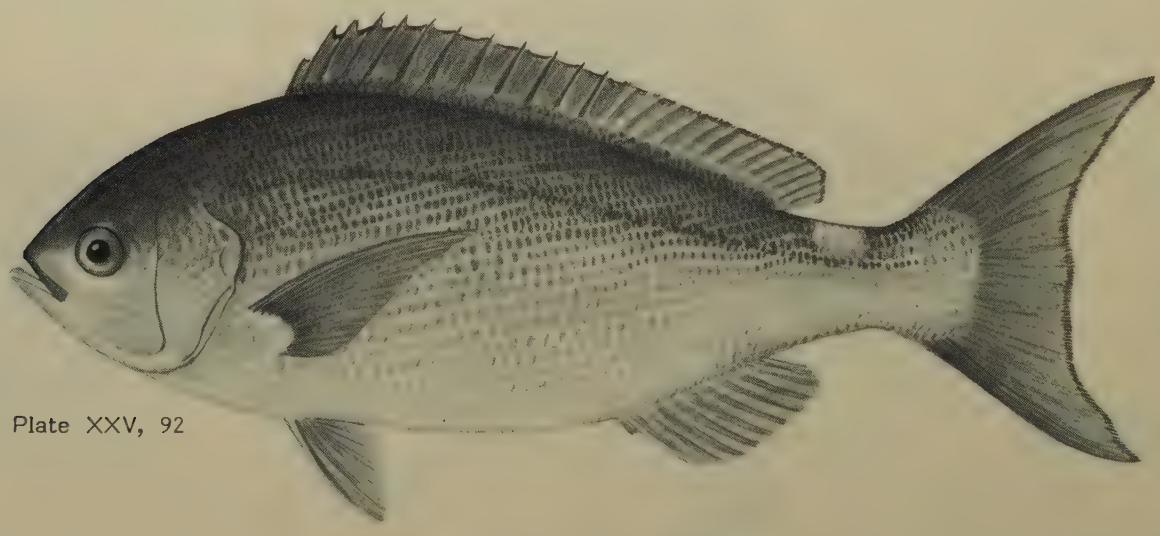
Pinjalo sp.

LUT Pinj 2

New species to be described by Allen and Randall.

Synonyms : None.

FAO Names : En - Slender pinjalo; Fr - Pinjalo fluet; Sp - Pinjalo cenceño.



See Plate XXV, 92

Diagnostic Features : Body moderately deep. Dorsal profile of head high; interorbital space strongly convex; eye relatively large (about equal to snout length or greater), with an adipose eyelid; preorbital bone narrow, less than eye diameter; snout relatively short and pointed; mouth small, the maxilla reaching below front of eye; a single row of small, conical teeth in jaws, enlarged anteriorly, and an inner band of villiform teeth; gill rakers on lower limb of first arch (including rudiments) 15 to 17. Dorsal fin with 12 spines and 13 soft rays; anal fin with 3 spines and 9 soft rays; both fins with a scaly sheath at base; pectoral fins long, reaching level of anus, usually with 17 rays; caudal fin emarginate. Scales moderate-sized, about 47 to 52 in lateral line; predorsal scales on top of head beginning above middle of eye; scale rows above and below lateral line rising obliquely toward dorsal profile. Colour: pink or red on back, whitish or silvery on lower sides and belly; a white spot generally present on upper half of caudal peduncle; dorsal and caudal fins reddish, often with a narrow black margin; pelvic and anal fins whitish or pink.

Geographical Distribution : Tropical western Pacific and Indian Oceans from New Guinea to the Arabian Peninsula and northward to the Ryukyu Islands.

Habitat and Biology : Inhabits reefs and rocky bottoms to depths of about 60 m. Feeds on benthic and planktonic invertebrates and possibly small fishes.

Size : Maximum total length about 50 cm; common to 30 cm.

Interest to Fisheries : Of potential interest to fisheries, but caught in relatively small amounts. Mainly taken with handlines, traps and bottom trawls. Marketed fresh or dried-salted.

Local Names : JAPAN: Sedakatakasago.

Literature : Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984).

Pristipomoides Bleeker, 1852

LUT Prist

Genus : Pristipomoides Bleeker, 1852:575. Type-species Pristipomoides typus Bleeker, 1852, by monotypy.

Synonyms : Genus Chaetopterus Schlegel, 1844; Genus Platyinius Gill, 1862; Genus Tropidinius Poey, 1868; Genus Bowersia Jordan & Evermann, 1902; Genus Rooseveltia Jordan & Seale, 1906; Genus Ulaula Jordan & Thompson, 1911; Genus Arnillo Jordan, Evermann & Tanaka, 1927.

Diagnostic Features : Small to medium-sized snappers with fusiform bodies, relatively slender and elongate, often robust. Jaws generally with an outer row of enlarged, conical teeth and an inner band of villiform teeth; enlarged canines frequently on anterior part of jaws; vomerine tooth patch V-shaped or triangular (except roughly diamond-shaped or triangular with a long medial posterior extension in P. sieboldii); tongue without teeth (except in P. sieboldii); interorbital space flattened. Dorsal fin continuous, not incised at junction of spinous and soft portions; with 10 spines and 11 (rarely 10) soft rays; anal fin with 3 spines and 8 (rarely 7) soft rays; last soft ray of dorsal and anal fins extended, conspicuously longer than preceding rays; dorsal and anal fins scaleless; pectoral fins long, about 2/3 to as long as head, with 15 to 17 rays; caudal fin forked. Scales medium-sized to relatively small, about 47 to 74 in lateral line. Colour: frequently pink or rosy, sometimes purple, violet, or lavender; often silver or whitish on lower sides and belly.

jaws of Pristipomoides

Biology, Habitat and Distribution : Occurs in relatively shallow to moderately deep water (about 20 to 550 m depth), usually over rocky bottoms. Found solitarily or in small groups. The diet consists mainly of small fishes, squids, crustaceans and pelagic tunicates.

Geographical Distribution : Inshore tropical Indo-West Pacific and western Atlantic Oceans.

Interest to Fisheries : Pristipomoides species are important foodfishes in many areas, particularly at islands of the Indo-West Pacific. They are caught mainly with bottom longlines and deep handlines; also with beam trawls. The flesh is of good quality and marketed mainly fresh, sometimes frozen.

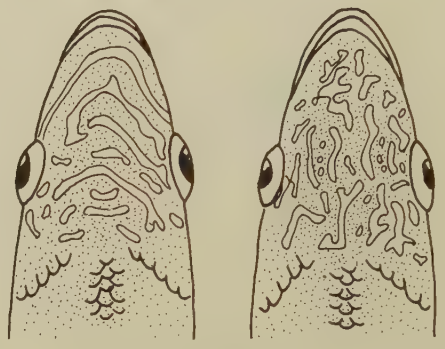
Key to the species of Pristipomoides :

1a. Scales relatively large, about 47 to 52 in lateral line

2a. Gill rakers on lower limb of first arch (including rudiments) 11 to 15; top of head marked with yellowish, transverse bars, lines, and spots; Indo-Pacific distribution

3a. Side of snout and preorbital space with 2 orange stripes (persisting as 4 brown stripes in preservative); preorbital space wide, 7.0, 5.5 and 4.0 times in head length at standard lengths of 15 cm, 25 cm and 40 cm respectively; top of head marked with yellowish transverse bars, some having an irregular chevron shape (Fig. 2a) ..... **P. multidens** (Fig. 1)

P. multidens Fig. 1



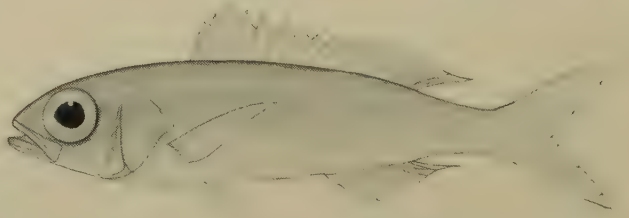
a. P. multidens b. P. typus top of head Fig. 2

3b. Side of snout and preorbital space without stripes; preorbital space narrow, 8.4, 7.3 and 5.8 times in head length at standard lengths of 15 cm, 25 cm and 40 cm respectively; top of head marked with yellowish longitudinal, vermiculated lines and spots (Fig. 2b) ..... **P. typus** (Fig. 3)

P. typus Fig. 3

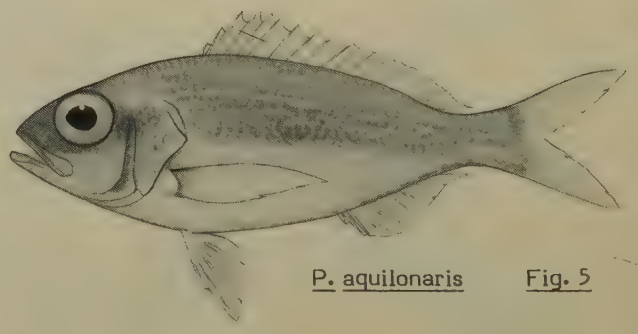
2b. Gill rakers on lower limb of first arch (including rudiments) 16 to 22; top of head uniform, without yellowish markings; Western Atlantic distribution

4a. Body slender, depth 3.5 to 4.2 times in standard length; total gill rakers on first arch (including rudiments) 28 to 31, 19 to 22 on lower limb.. **P. freemani** (Fig. 4)



P. freemani Fig. 4

4b. Body deeper, depth 2.5 to 3.2 times in standard length; total gill rakers 24 to 28 (usually 25 to 27), 16 to 20 (usually 17 to 19) on lower limb ..... **P. aquilonaris** (Fig. 5)



P. aquilonaris Fig. 5

1b. Scales smaller, about 54 to 74 in lateral line

5a. Scales small, about 70 to 74 in lateral line; gill rakers on lower limb (including rudiments) 17 to 22

6a. Tongue with a patch of granular teeth; vomerine tooth patch roughly diamond-shaped (Fig. 6a) or, if triangular, with an elongate posterior extension (Fig. 6b); body colour silvery with lavender hue (Indo-West Pacific) ..... **P. sieboldii** (Fig. 7)

6b. Tongue without teeth; vomerine tooth patch triangular (Fig. 6c); body colour purplish with numerous yellow spots or chevron-shaped bands on sides (Indo-West Pacific) ..... **P. auricilla** (Fig. 8)

5b. Scales larger, about 54 to 66 in lateral line; gill rakers on lower limb 8 to 18

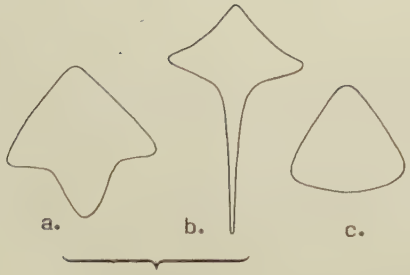
7a. Scales in lateral line 54 to 57; body relatively deep, usually about 2.5 to 3.0 times in standard length (Western Atlantic distribution) ..... **P. macrophthalmus** (Fig. 9)

7b. Scales in lateral line 58 to 66; body depth variable, about 2.6 to 3.8 times in standard length; Indo-Pacific distribution

8a. Body moderately deep, its depth about 2.6 to 3.0 times in standard length; yellow coloration on back or 4 oblique, yellow or orange bars on sides

9a. Body depth 2.8 to 3.0 times in standard length; back bright yellow; body with scattered blue spots and vermiculations (Western Pacific and Mauritius) ... **P. argyrogrammicus** (Fig. 10)

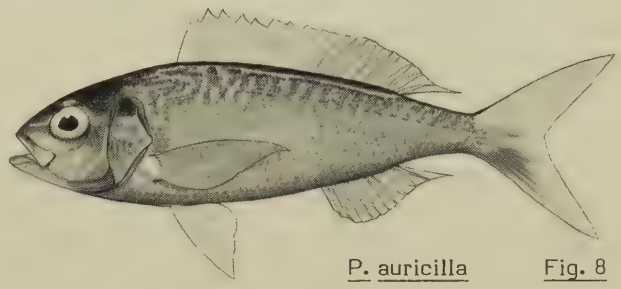
9b. Body depth 2.6 to 2.8 times in standard length; 4 oblique bars of yellow or orange on sides (widespread in the Indo-West Pacific) ..... **P. zonatus** (Fig. 11)



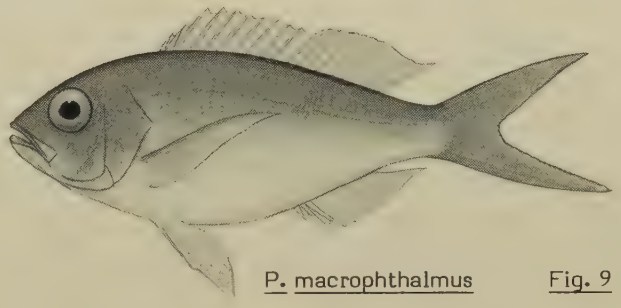
P. sieboldi P. auricilla

shapes of vomerine tooth patch Fig. 6

P. sieboldii Fig. 7

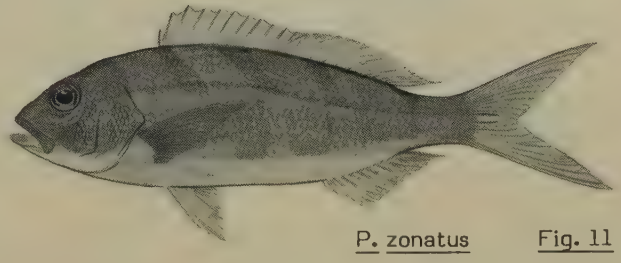


P. auricilla Fig. 8



P. macrophthalmus Fig. 9

P. argyrogrammicus Fig. 10



P. zonatus Fig. 11

8b. Body more slender, its depth about 3.1 to 3.8 times in standard length; body colour uniform without yellow on back or oblique bars on sides

10a. Length of upper jaw 2.4 to 2.6 times in head length; interorbital space broad, about 3.7 to 4.2 times in head length; preorbital space relatively narrow, its depth about 7.6 to 9.0 times in head length; depth of preorbital space about 2.0 to 2.3 times in interorbital width; canine teeth near middle of lower jaw not greatly enlarged; pyloric caeca 7 to 9 (usually 8) ..... **P. filamentosus** (Fig. 12)

10b. Length of upper jaw 2.1 to 2.4 times in head length; interorbital space narrower, about 4.5 to 4.7 times in head length; preorbital space broader, its depth about 6.2 to 6.8 times in head length; depth of preorbital space about 1.3 to 1.6 times in interorbital width; canine teeth near middle of lower jaw greatly enlarged; pyloric caeca 4 to 6 (usually 5) ..... **P. flavipinnis** (Fig. 13)

P. filamentosus Fig. 12

P. flavipinnis Fig. 13

Pristipomoides aquilonaris (Goode & Bean, 1896)

LUT Prist 2

Anthias aquilonaris Goode & Bean 1896, Oceanic Ichthyology:238 (Gulf of Mexico).

Synonyms : Pristipomoides andersoni Ginsburg (1952).

FAO Names : En - Wenchman; Fr - Colas vorace; Sp - Panchito voraz.

See Plate V, 16

Diagnostic Features : Body oblong, moderately deep (greatest depth 2.6 to 2.9 times in standard length). Interorbital space flat, dorsal profile of snout and nape convex; eye large, about 3.2 to 3.5 times in head length; snout short and blunt; vomerine tooth patch V-shaped or triangular, without a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 17 to 19 (rarely 16 or 20). Dorsal fin with 10 spines and 11 (rarely 10) soft rays; anal fin with 3 spines and 8 (rarely 7) soft rays; bases of dorsal and anal fins scaleless, their last soft rays moderately produced; pectoral fins long, reaching level of anus, with 15 or 16 (rarely 14 or 17) rays; caudal fin forked. Scales moderate-sized, 48 to 52 in lateral line; scale rows on back parallel to lateral line. Colour: back and upper sides pink to reddish; lower sides and belly pink to silvery-white; fins translucent to pinkish except outer part of dorsal and caudal fins yellow.

Geographical Distribution : Tropical western Atlantic Ocean extending northward to North Carolina and south to Brazil.

Habitat and Biology : A deep-water species found from 24 to at least 366 m depth. Feeds mainly on small fishes.

Size : Maximum total length about 23 cm; common to 20 cm.

Interest to Fisheries : Apparently abundant and because of its small size of potential use as fish meal. Caught mainly with beam trawls; also with longlines and handlines. Marketed mostly fresh, rarely frozen.

Local Names : MEXICO: Voraz; VENEZUELA: Panchito.

Literature : Jordan & Evermann (1896); Anderson (1967); Fischer (ed.) (1978); Uyeno et al. (1983).

Pristipomoides argyrogrammicus (Valenciennes, 1831)

LUT Prist 8

Serranus argyrogrammicus Valenciennes (in C. & V.), 1831, Hist.Nat.Poiss., 8:183 (Mauritius).

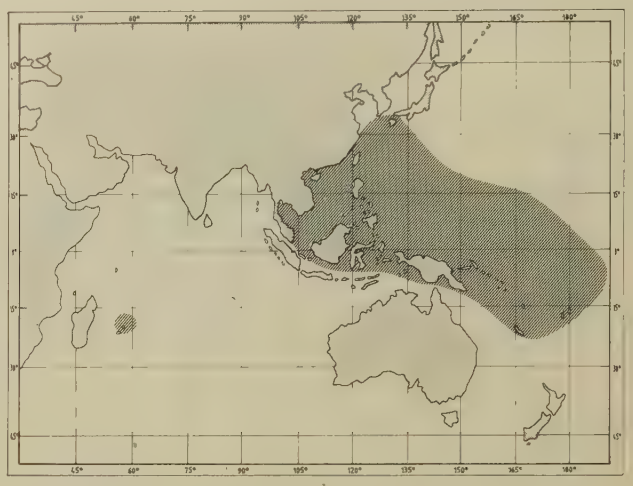
Synonyms : Platynius amoenus Snyder (1911).

FAO Names : En - Ornate jobfish; Fr - Colas orné; Sp - Panchito adornado.

See Plate XXV, 93

Diagnostic Features : Body moderately deep (greatest depth 2.8 to 3.0 times in standard length). Interorbital space slightly convex, its width 3.5 to 4.2 times in head length; preorbital depth 7.0 to 8.0 times in head length; jaws about equal, both with bands of fine teeth, the outer ones slightly enlarged, but not as prominent canines; vomerine tooth patch V-shaped; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 8 to 14. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 15 or 16 rays; caudal fin forked. Scales relatively small, about 58 to 66 in lateral line; scale rows on back parallel to lateral line. Colour: upper part of head reddish; back mainly yellow; sides and belly silvery, sometimes pinkish; body with many bright blue spots and vermiculations; dorsal and caudal fins yellowish.

Geographical Distribution : Widespread in the Indo-West Pacific from Samoa to Mauritius and from New Caledonia northward to southern Japan. However, Mauritius is the only reported locality in the Indian Ocean.



Habitat and Biology : Occurs over rocky bottoms at depths between about 70 and 300 m. Feeds on small fishes, crustaceans, and squids.

Size : Maximum total length about 40 cm; common to 25 cm.

Interest to Fisheries : A good eating fish sometimes seen in markets. Caught mainly with handlines. Marketed fresh.

Local Names : GUAM: Blueline gindai; JAPAN: Hana fuedai; NEW CALEDONIA: Cerf-volant; SAMOA: Palu-tusimoana.

Literature : Amesbury & Myers (1982, as P. amoenus); Masuda et al. (1984, as P. amoenus).

Remarks : Often referred to as P. amoenus by previous authors.

Pristipomoides auricilla (Jordan, Evermann & Tanaka, 1927)

LUT Prist 9

Arnillo auricilla Jordan, Evermann & Tanaka, 1927, Proc.California Acad.Sci., ser. 4, 16:668 (Honolulu).

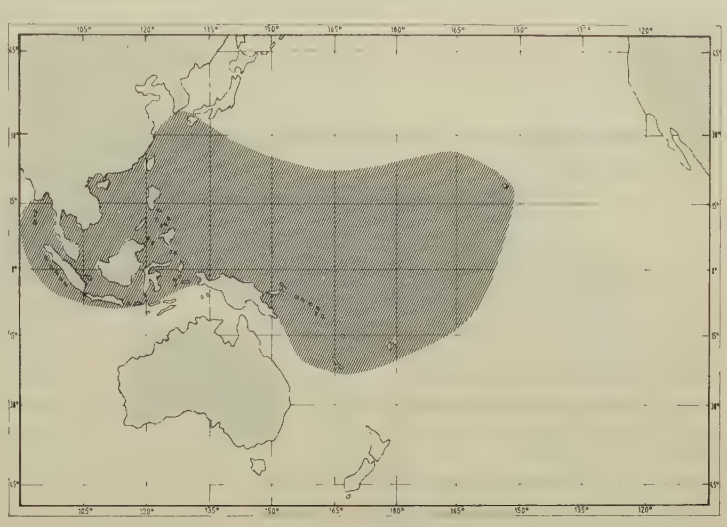
Synonyms : None.

FAO Names : En - Goldflag jobfish; Fr - Colas drapeau; Sp - Panchito abanderado.

See Plate XXVI, 94

Diagnostic Features : Body elongate, robust (greatest depth 3.1 to 3.6 times in standard length). Interorbital space flat, its width 3.4 to 3.7 times in head length; preorbital depth 6.7 to 8.2 times in head length; jaws about equal or the lower slightly protruding, both with an outer row of conical and canine teeth and an innner band of villiform teeth; vomerine tooth patch triangular; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 17 to 21. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 16 rays; caudal fin forked. Scales small, about 70 to 74 in lateral line; scale rows on back parallel to lateral line. Colour: body purplish or brownish violet; sides with numerous yellow spots or faint, yellow, chevron-shaped bands; upper lobe of caudal fin yellow; dorsal fin yellowish to yellowish-brown. Sexual dichromatism: males over 27 cm (fork length) with much yellow on ventral lobe of caudal fin, usually forming a distinct blotch; females with or without yellowish colour on ventral lobe of caudal fin, but if yellow present, not forming a distinct blotch.

Geographical Distribution : Widespread in the tropical Indo-Pacific Ocean from Hawaii to the Andaman Sea, and northward to Japan.



Habitat and Biology : Occurs over rocky bottoms between about 90 and 360 m; most abundant from about 180 to 270 m. Feeds on fishes, pelagic tunicates and salps. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (MP were estimated as 0.27 and 0.66 respectively for the Mariana Islands population (Ralston, in press).

Size : Maximum total length about 45 cm; common to 25 cm.

Interest to Fisheries : A common foodfish in some areas such as Samoa and Guam. Caught mainly with deep handlines. Marketed fresh. During a recent experimental handline fishing survey in the Mariana Islands, this fish was the second-most abundant species, constituting 15% of the total catch.

Local Names : GUAM: Kali kali; JAPAN: Kimadara-himedai; NEW CALEDONIA: Vivaneau à taches jaunes; SAMOA: Palu-i'usama.

Literature : Kami (1973); Kyushin et al. (1977); Amesbury & Myers (1982); Masuda et al. (1984).

Pristipomoides filamentosus (Valenciennes, 1830)

LUT Prist 5

Serranus filamentosus Valenciennes (in C. & V., 1830), Hist.Nat.Poiss., 6:508 (St. Denis, Bourbon; Mauritius).

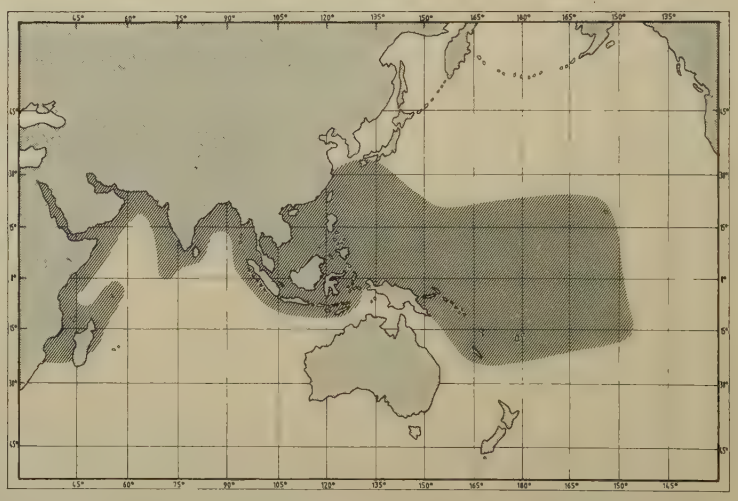
Synonyms : Chaetopterus microlepis Bleeker (1869b); Etelis brevirostris Vaillant (1873); Aprion microdon Steindachner, 1876; Aphareus roseus Castelnau, 1879; Bowersia violescens Jordan & Evermann (1903); Aprion kanekonis Tanaka (1935).

FAO Names : En - Crimson jobfish; Fr - Colas fil; Sp - Panchito hebra.

See Plate XXVI, 95

Diagnostic Features : Body elongate, robust (greatest depth 3.3 to 3.8 times in standard length). Interorbital space flat, its width 3.8 to 4.2 times in head length; preorbital depth 7.6 to 9.2 times in head length; lower jaw slightly protruding; both jaws with an outer row of conical and canine teeth and an inner band of villiform teeth, canines at front of lower jaw not greatly enlarged; vomerine tooth patch triangular; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 14 to 16. Dorsal fin with 10 spines and 12 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 15 or 16 rays; caudal fin forked. Scales relatively small, about 60 to 65 in lateral line; scale rows on back parallel to lateral line. Colour: back and sides variable, ranging from brownish to lavendar or reddish-purple; snout and interorbital space with narrow yellow lines and blue spots often persisting as dark spots in preservative; dorsal and caudal fins light blue or lavendar with reddish-orange margins.

Geographical Distribution : Widespread in the tropical Indo-Pacific Ocean from Hawaii to East Africa, extending northward to southern Japan.



Habitat and Biology : Occurs over rocky bottoms at depths between about 90 and 360 m. Moves to the upper portion of its depth range at night to feed on small fishes, shrimps, crabs, amphipods, ascidians and pelagic items including salps and urochordates. Around the Hawaiian Islands, spawning occurs from March to December with peak activity from May to September. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.29 and 0.53 respectively for the Vanuatu (New Hebrides) population (Brouard & Grandperrin, 1984) and 0.15 and 0.25 respectively for the Mariana Islands population (Ralston, 1984). Estimated maximum age: 18 years.

Size : Maximum total length about 80 cm; common to 50 cm. Matures at about 35 to 50 cm.

Interest to Fisheries : A good quality foodfish. It is one of the principal species in the Hawaiian offshore handlines fishery (246.5 metric tons and revenue of US$ 1 605 000 in 1984), commanding a high price (about US$ 7.40 per kg at dockside and US$ 16 to US$ 20 per kg retail). Caught mainly with bottom longlines and deep handlines. Marketed mainly fresh.

Local Names : GUAM: Pink opakapaka; HAWAII: Opakapaka; JAPAN: Ôhime; NEW CALEDONIA: Vivaneau blanc; SAMOA: Palu-ena'ena; SOUTH AFRICA: Dagbreek-jobvis, Rosy jobfish; THE PHILIPPINES: Ula-ula.

Literature : Kami (1973); Amesbury & Myers (1982); Fischer & Bianchi (eds) (1984); Gloerfelt-Tarp & Kailola (1984); Masuda et al. (1984).

Pristipomoides flavipinnis Shinohara, 1963 | LUT Prist 10

Pristipomoides flavipinnis Shinohara, 1963, Bull.Arts Sci.Div., Ryukyu Univ., 6:49 (Ryukyu Islands).

Synonyms : None.

FAO Names : En - Golden eye jobfish; Fr - Colas oeil doré; Sp - Panchito de ojo dorado.

See Plate XXVI, 96

Diagnostic Features : Body elongate, robust (greatest depth 3.2 to 3.7 times in standard length). Interorbital space flat, its width 4.5 to 4.7 times in head length; preorbital depth 6.2 to 6.8 times in head length; lower jaw slightly protruding; both jaws with an outer row of conical and canine teeth and an inner band of villiform teeth, canines at front of lower jaw enlarged; vomerine tooth patch triangular; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 15 to 18. Dorsal fin with 10 spines and 12 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 16 rays; caudal fin forked. Scales relatively small, about 59 to 62 in lateral line; scale rows on back parallel to lateral line. Colour: back and upper sides pale lavender or pinkish; lower sides and belly silvery; network of dark spots on top of head; margin of dorsal fin yellow when fresh.

Geographical Distribution : Tropical western Pacific Ocean from Samoa to southeastern Asia, and northward to the Ryukyu Islands.

Habitat and Biology : Occurs over rocky bottoms at depths between about 90 and 360 m; it is most abundant between 180 and 270 m. Feeds primarily on benthic fishes and to a lesser extent on crustaceans, larval squids and pelagic tunicates. At Vanuatu (New Hebrides), spawning occurs throughout the year with peak activity from December to February. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.36 and 0.83 respectively for the Vanuatu population (Brouard & Grandperrin, 1984).

Size : Maximum total length about 60 cm; common to about 40 cm.

Interest to Fisheries : An important market fish in some areas. During a recent experimental handline fishing survey in the Mariana Islands, this fish was the fourth-most abundant species, constituting 6.5% of the total catch. Caught mainly with bottom longlines and handlines. Marketed mainly fresh.

Local Names : GUAM: Opakapaka; JAPAN: Kinme-himedai; NEW CALEDONIA: Vivaneau à nageoires jaunes; SAMOA: Palu-sina.

Literature : Kami (1973); Amesbury & Myers (1982); Masuda et al. (1984).

Pristipomoides freemani Anderson, 1966

LUT Prist 4

Pristipomoides freemani Anderson, 1966, Bull.Mar.Sci., 16(4):814 (off Caribbean coast of Columbia).

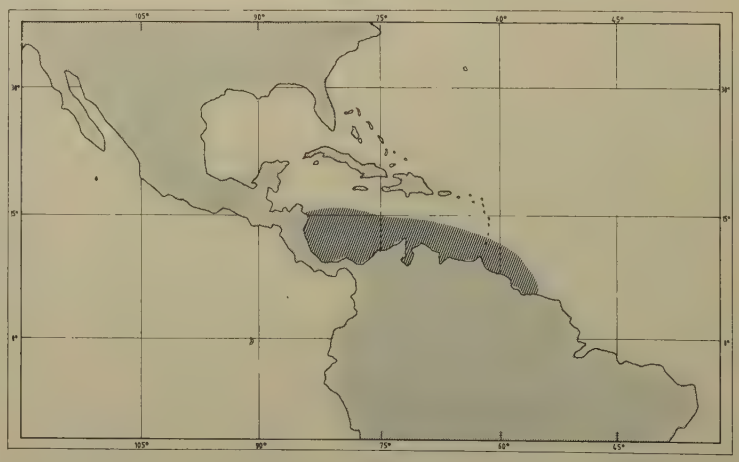
Synonyms : None.

FAO Names : En - Slender wenchman; Fr - Colas élégant; Sp - Panchito menudo.

See Plate V, 17

Diagnostic Features : Body elongate (greatest depth 3.8 to 3.9 times in standard length). Interorbital space flat; eye large (about 3.8 times in head length); vomerine tooth patch triangular, without a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 20 to 21 (rarely 19 or 22). Dorsal fin with 10 spines and 12 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins not reaching level of anus, with 16 (rarely 15 or 17) rays; caudal fin forked. Scales moderate-sized, 50 or 51 in lateral line; scale rows on back parallel to lateral line. Colour: back and upper sides yellow-orange or pinkish; lower sides and belly silvery-white caudal fin and distal edge of dorsal fin yellowish or orange; remainder of dorsal and other fins translucent or whitish.

Geographical Distribution : Tropical western Atlantic Ocean along the coasts of Panama, Colombia, and Suriname.



Habitat and Biology : The habitat is poorly documented, but most specimens have been trawled from relatively deep water at the upper edge of the continental shelf.

Size : Maximum total length about 20 cm.

Interest to Fisheries : Of limited interest because of the small size and deep distribution. Caught mainly with trawls.

Local Names : -

Literature : Anderson (1967); Uyeno et al. (1983).

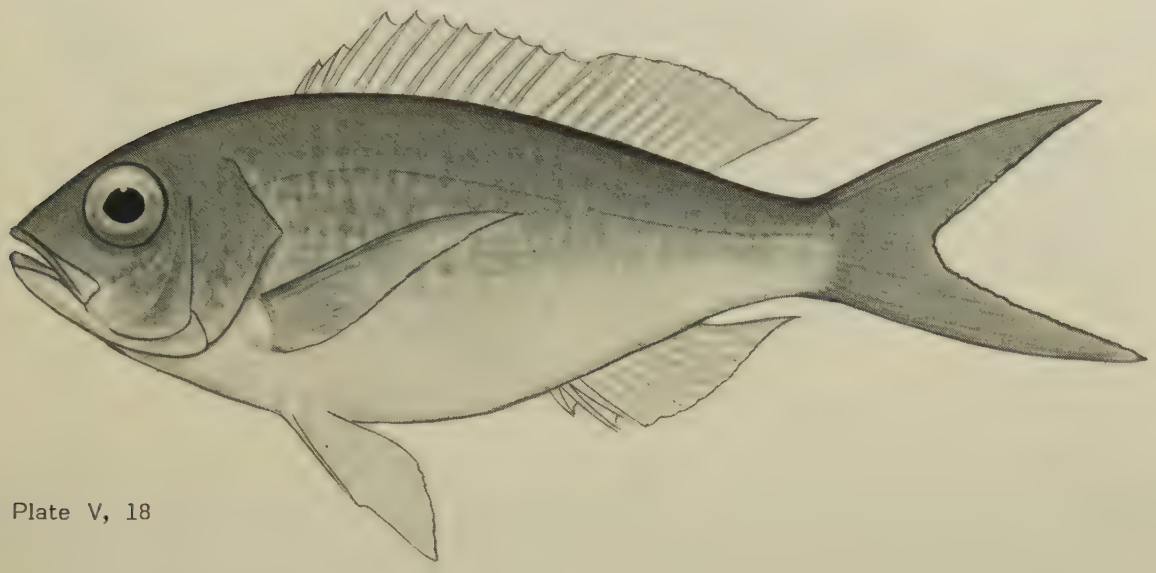
Pristipomoides macrophthalmus (Müller & Troschel, 1848)

LUT Prist 3

Centropristes macrophthalmus Müller & Troschel (in Schomburgk, 1848), Hist.Barbados:666 (Barbados).

Synonyms : None.

FAO Names : En - Cardinal snapper; Fr - Colas gros yeux; Sp - Panchito ojón.



See Plate V, 18

Diagnostic Features : Body oblong, moderately deep. Interorbital space flat; dorsal profile of snout and nape convex; eye large; snout short and blunt; vomerine tooth patch V-shaped or triangular, without a medial posterior extension; gill rakers on lower limb of first arch (including rudiments) 14 to 16 (rarely 13 or 17). Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; last soft rays of dorsal and anal fins moderately produced; pectoral fins long, reaching level of anus, with 15 or 16 rays; caudal fin forked. Scales small, 54 to 57 in lateral line; scale rows on back parallel to lateral line. Colour: back and upper sides pink with a silvery sheen; lower sides and belly silvery; fins translucent to pink.

Geographical Distribution : Tropical western Atlantic. Known from the Straits of Florida, the Bahamas, greater Antilles and the Caribbean coast of Nicaragua and Panama.

Habitat and Biology : Inhabits depths from about 110 to at least 550 m. Most commonly found in deeper waters of the shelf near the edge of the continental slope. Feeds on small fishes and larger planktonic animals.

Size : Maximum total length about 50 cm; common to 30 cm.

Interest to Fisheries : Of limited interest because of the deep distribution and small size. Caught mainly with single and multiple handlines, also with bottom trawls. Marketed fresh.

Local Names : CUBA: Cardenal, Voraz.

Literature : Jordan & Evermann (1896); Anderson (1967); Fischer (ed.) (1978).

Pristipomoides multidens (Day, 1870)

LUT Prist 6

Mesoprion multidens Day, 1870, Proc.Zool.Soc.London:680 (Andaman Islands).

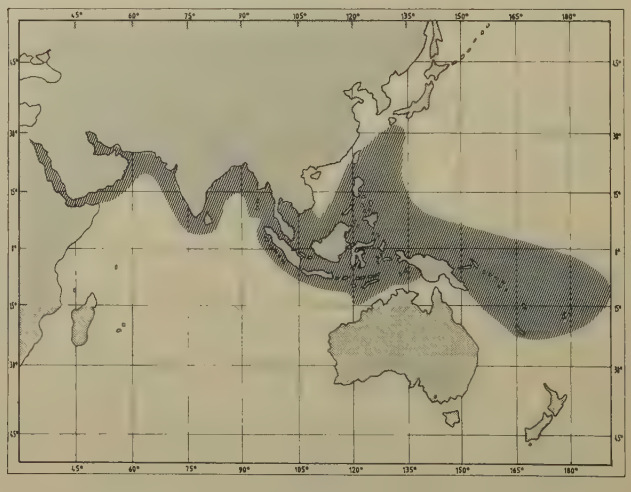
Synonyms : Diacope sparus Temminck & Schlegel (1842)..

FAO Names : En - Goldbanded jobfish; Fr - Colas à bandes dorées; Sp - Panchito de bandas doradas.

See Plate XXVI, 97

Diagnostic Features : Body elongate, robust (greatest depth 3.0 to 3.1 times in standard length). Interorbital space flat; lower jaw slightly protruding; both with an outer row of conical teeth, the anterior 2 or 3 pairs enlarged canines, and with an inner band of villiform teeth; vomerine tooth patch triangular; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 11 to 15. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 15 or 16 rays; caudal fin forked. Scales moderate-sized about 48 to 52 in lateral line; scale rows on back parallel to lateral line. Colour: yellowish to rosy, with about 6 broken, golden stripes on sides; side of snout and cheek with 2 golden stripes bordered with blue (which persist as 4 brownish stripes in preservative); top of head with a series of chevron-shaped yellow bands with apexes directed anteriorly; dorsal fin with yellowish stripes or rows of spots.

Geographical Distribution : Widely distributed in the tropical Indo-Pacific Ocean from Samoa to the Red and Arabian Seas, and from southern Japan southward to Australia.



Habitat and Biology : Occurs over rocky bottoms at depths between about 40 and 200 m. Feeds on fishes, shrimps, crabs, lobsters, stomatopods, squids and pelagic items including gastropods and urochordates. Spawning has been reported during May and August in the South China Sea and throughout most of the year at Samoa and Vanuatu (New Hebrides) with peak activity during December and January at the latter locality. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.24 and 0.42 respectively for the Vanuatu population (Brouard & Grandperrin, 1984) and 0.19 and 0.63 respectively for the Mariana Islands population (Ralston, in press). Estimated maximum age: 14 years.

Size : Maximum total length about 90 cm; common to 50 cm. Matures at about 40 to 50 cm.

Interest to Fisheries : An excellent foodfish, often seen in markets, but usually in small quantities. This species, along with P. typus, constituted 1.4% (by weight) of the trawl catch on the Northwest Shelf (Australia) between 1971 and 1976. Caught mainly with handlines. Marketed fresh.

Local Names : JAPAN: Nagasaki fuedai; NEW CALEDONIA: Vivaneau grosse-écaille; SAMOA: Palu-sega.

Literature : Senta & Tan (1974); Kyushin et al. (1977); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

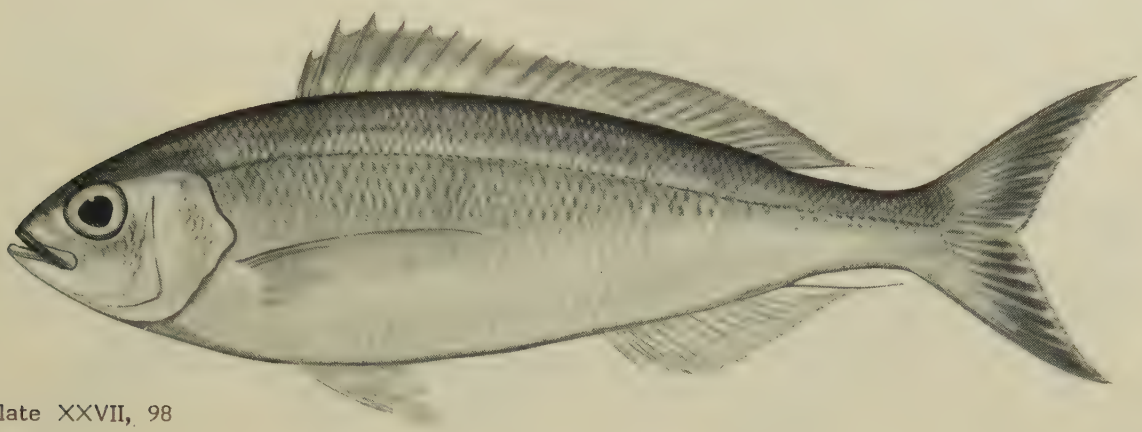
Pristipomoides sieboldii (Bleeker, 1857)

LUT Prist 7

Chaetopterus sieboldii Bleeker, 1857, Verh.Batav.Genootsch., 26:20 (Japan).

Synonyms : Chaetopterus dubius Günther (1859); Bowersia ulaula Jordan & Evermann (1903).

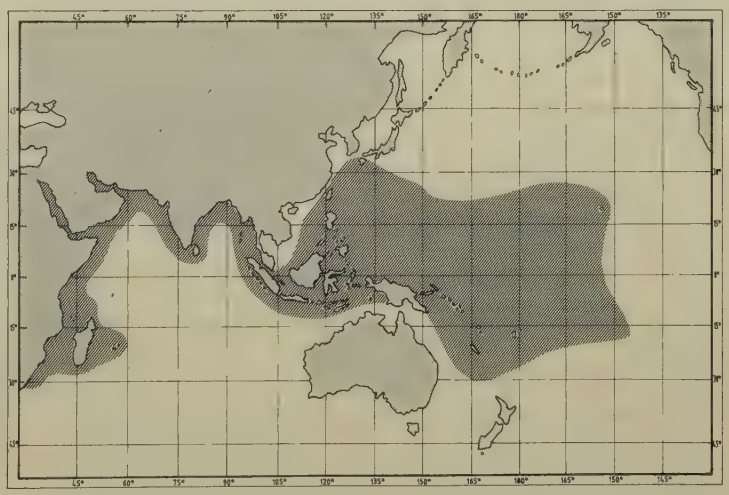
FAO Names : En - Lavender jobfish; Fr - Colas lavande; Sp - Panchito lavanda.



See Plate XXVII, 98

Diagnostic Features : Body elongate, robust (greatest depth 3.1 to 3.8 times in standard length). Interorbital space flat; lower jaw slightly protruding; both jaws with an outer band of conical and canine teeth and an inner band of villiform teeth; vomerine tooth patch diamond-shaped; teeth present on tongue; gill rakers on lower limb of first arch (including rudiments) 19 to 22. Dorsal fin with 10 spines and 11 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 16 rays; caudal fin forked. Scales small, about 70 to 74 in lateral line; scale rows on back parallel to lateral line. Colour: silvery with lavendar hue; dark spots on top of head, more conspicuous in young; margin of dorsal fin orange; caudal fin purplish with the inner margin of fork pale.

Geographical Distribution : Widespread in the tropical Indo-Pacific from Hawaii to East Africa, and northward to southern Japan.



Habitat and Biology : Occurs over rocky bottoms at depths between about 180 and 360 m. Feeds mainly on fishes, shrimps, crabs, polychaetes, cephalopods and pelagic urochordates.

Size : Maximum total length about 60 cm; common to 40 cm.

Interest to Fisheries : A common foodfish in some areas such as Japan. It is one of the principal species in the Hawaiian offshore handline fishery (12 metric tons and revenue of US$ 56 400 in 1984). Caught mainly with bottom longlines and deep handlines. Marketed mostly fresh.

Local Names : HAWAII: Kalikali; JAPAN: Himedai; TAHITI: Utu; THE PHILIPPINES: Kalaskasin, Manambulao, Talotoon.

Literature : Kami (1973); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Pristipomoides typus Bleeker, 1852

LUT Prist 1

Pristipomoides typus Bleeker, 1852, Nat.Tijds.Nederland.Indië, 3:575 (Western Sumatra).

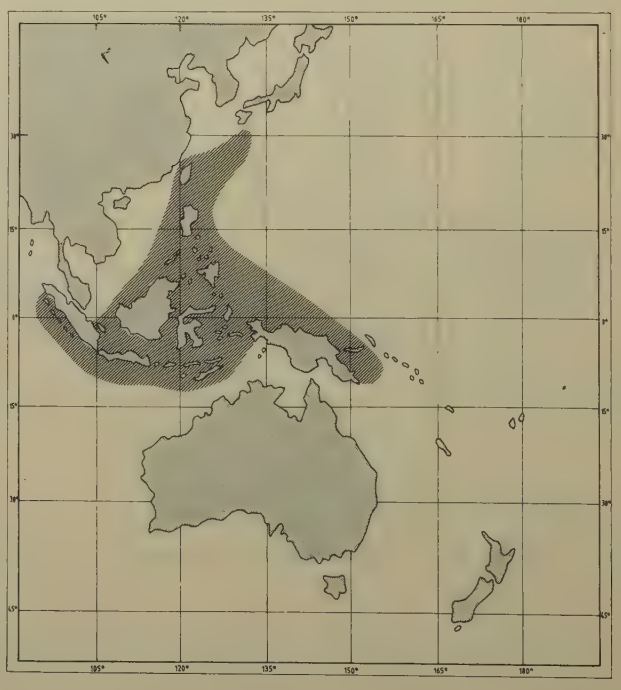
Synonyms : None.

FAO Names : En - Sharptooth jobfish; Fr - Colas dentu; Sp - Panchito dentón.

See Plate XXVII, 99

Diagnostic Features : Body elongate, robust (greatest depth 3.0 to 3.1 times in standard length). Interorbital space flat; jaws about equal, both with an outer row of conical and canine teeth and an inner band of villiform teeth; vomerine tooth patch triangular; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 11 to 15. Dorsal fin with 10 spines and 11 or 12 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 16 rays; caudal fin forked. Scales moderate-sized, about 48 to 52 in lateral line; scale rows on back parallel to lateral line. Colour: body and fins rosy red; top of head with longitudinal vermiculated lines and spots of brownish yellow; dorsal fin with wavy yellow lines.

Geographical Distribution : Tropical western Pacific from New Guinea to Sumatra, and northward to the Ryukyu Islands. Records from the western Indian Ocean need to be confirmed.



Habitat and Biology : Occurs over rocky bottoms at depths between about 40 and 100 m. Feeds on benthic invertebrates and fishes. Estimated maximum age: 11 years.

Size : Maximum total length about 70 cm; common to 40 cm. Matures at about 28 cm.

Interest to Fisheries : A good-eating fish sometimes seen in markets. Caught mainly with handlines. Usually offered fresh. This species, along with P. multidens, constituted 1.4% (by weight) of the trawl catch of the Northwest Shelf (Australia) between 1971 and 1976.

Local Names : JAPAN: Bara-hime dai; SAUDI ARABIA: Sarrah; SRI LANKA: Kalamiya (S), Lomia (T); THAILAND: Pla kapong; THE PHILIPPINES: Agbaon, Besugo laut, Langisi, Matangal.

Literature : Senta & Tan (1975); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Pristipomoides zonatus (Valenciennes, 1830)

LUT Prist 11

Serranus zonatus Valenciennes (in C. & V.), 1830, Hist.Nat.Poiss., 6:509 (Mauritius).

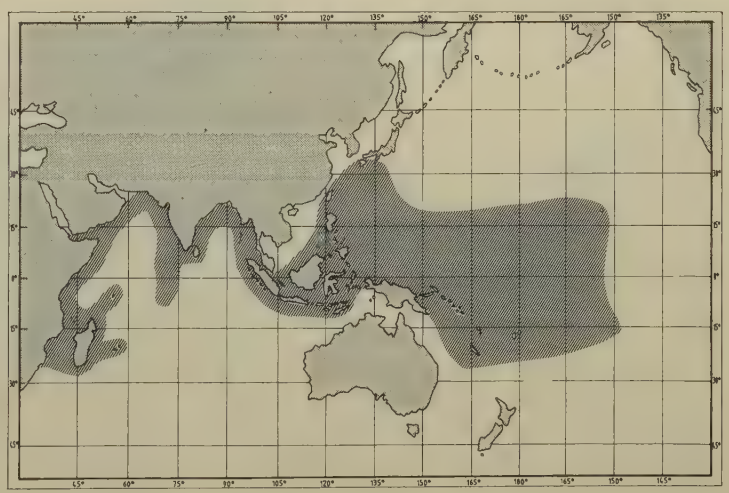
Synonyms : (From Fowler, 1931) ? Serranus argyrogrammicus Valenciennes (in C. & V.), 1831; Serranus telfairi Bennett (1831); Serranus brighami Seale (1901); Rooseveltia aloha Jordan & Snyder (1907).

FAO Names : En - Oblique-banded snapper; Fr - Colas bagnard; Sp - Panchito rayado.

See Plate XXVII, 100

Diagnostic Features : Body moderately deep (greatest depth about 2.6 to 2.8 times in standard length). Interorbital space convex; jaws about equal, or lower jaw slightly protruding; both jaws with bands of fine teeth, the outer ones slightly enlarged, but not as prominent canines; vomerine tooth patch V-shaped; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 12 or 13. Dorsal fin with 10 spines and 10 or 11 soft rays; anal fin with 3 spines and 8 soft rays; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; pectoral fins long, reaching level of anus, with 16 rays; caudal fin forked. Scales relatively small, about 60 to 66 in lateral line; scale rows on back parallel to lateral line. Colour: overall pink or reddish with 4 broad oblique orange or yellow bars on sides; dorsal and caudal fins yellow, other fins pink.

Geographical Distribution : Widespread in the tropical Indo-Pacific Ocean from Hawaii to East Africa, and from southern Japan southward to New Caledonia.



Habitat and Biology : Occurs over rocky bottoms between about 70 and 300 m depth; most abundant between about 100 and 200 m. Feeds on fishes, shrimps, crabs, cephalopods, other benthic invertebrates and planktonic organisms, including urochordates. The von Bertalanffy growth coefficient (K) and exponential rate of mortality (M) were estimated as 0.20 and 0.53 respectively for the Marianas Islands population (Ralston, in press).

Size : Maximum total length about 50 cm; common to 35 cm.

Interest to Fisheries : A good eating fish occasionally seen in markets. Caught mainly with handlines. During a recent experimental handline fishery survey in the Marianas Islands, this fish was by far the most abundant species, constituting 51% of the total catch. It is one of the principal species in the Hawaiian offshore handline fishery (34 metric tons and revenue of US$ 18 400 in 1984). Marketed fresh.

Local Names : GUAM: Gindai; JAPAN: Shimachi biki; PALAU: Turang; SOUTH AFRICA: Oblique banded snapper, Skeefband-snapper; TAHITI: Ulu.

Literature : Fowler (1931); Amesbury & Myers (1982); Fischer & Bianchi (eds) (1984); Masuda et al. (1984).

Remarks : This species is frequently placed in the genus Tropidinius Poey. Former FAO code LUT Trop 1 (western Indian Ocean).

Randallichthys Anderson, Kami & Johnson, 1977

LUT Rand

Genus : Randallichthys Anderson, Kami & Johnson, 1977:89. Type-species Etelis filamentosus Fourmanoir, 1970, by original designation.

Synonyms : None.

A single species in the genus - see Randallichthys filamentosus.

Randallichthys filamentosus (Fourmanoir, 1970)

LUT Rand 1

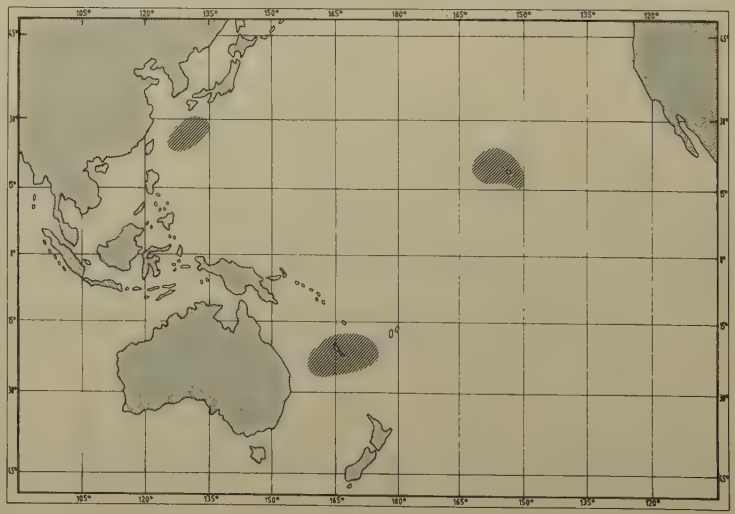
Etelis filamentosus Fourmanoir, 1970, Cah.O.R.S.T.O.M., sér. Océanogr., 8(2):26, 28-29 ($22^{o}52'S$, $162^{o}20'E$).

Synonyms : Etelis nudimaxillaris Yoshino & Araga (in Masuda et al., 1975).

FAO Names : En - Randall's snapper; Fr - Vivaneau de Randall; Sp - Pargo de Randall.

See Plate XXVII, 101

Diagnostic Features : Body relatively elongate. Head blunt; interorbital space flat; eye large; preorbital bone relatively narrow; snout short; maxilla extending to level of front of eye; lower jaw protruding; vomerine tooth patch V-shaped, without a medial posterior extension; tongue without teeth; gill rakers on lower limb of first arch (including rudiments) 14 (occasionally 15 or 16). Dorsal fin with 10 spines and 12 soft rays; anal fin with 3 spines and 9 soft rays; bases of dorsal and anal fins scaleless; pectoral fins short, not reaching level of anus, with 16 or 17 rays; caudal fin lunate, its lower lobe with some rays excessively produced and filamentous in young. Scales moderate-sized, about 48 or 49 in lateral line; scale rows on back parallel to lateral line. Colour: rosy red with a yellowish tinge; fins similar except dorsal fin greyish; outer edge of spinous dorsal and pelvic fins black.



Geographical Distribution : Western and central Pacific Ocean. Known thus far only from the Hawaiian Islands, New Caledonia, and Okinawa, but probably widespread in the area.

Habitat and Biology : Inhabits rocky bottoms in relatively deep water (150 to 300 m).

Size : Maximum total length of about 60 cm; common to 40 cm.

Interest to Fisheries : So far caught in relatively small quantities. The flesh is of good quality and thus the species is of potential interest. Caught mainly with handlines. Marketed fresh.

Local Names : -

Literature : Anderson, Kami & Johnson (1977).

Rhomboplites Gill, 1862 | LUT Rhomb

Genus : Rhomboplites Gill, 1862:237. Type-species Centropristis aurorubens Cuvier (in C. & V.), 1829, by original designation.

Synonyms : None.

A single species in the genus - see Rhomboplites aurorubens.

Rhomboplites aurorubens (Cuvier, 1829) | LUT Rhomb 1

Centropristis aurorubens Cuvier (in C. & V., 1829), Hist.Nat.Poiss., 3:45 (Brazil).

Synonyms : Mesoprion elegans Poey (1860); Aprion ariommus Jordan & Gilbert (1883).

FAO Names : En - Vermilion snapper; Fr - Vivaneau ti-yeux; Sp - Pargo cunaro.

See Plate V, 19

Diagnostic Features : Body relatively slender. Snout short, lower jaw slightly projecting; mouth small; large canines absent; vomerine tooth patch triangular or roughly diamond-shaped, with a broad, elongate medial posterior extension; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 19 to 22. Dorsal fin with 12 (rarely 13) spines and 10 or 11 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins relatively short, not reaching level of anus, with 17 or 18 (rarely 19) rays; caudal fin moderately forked. Scale rows on back rising obliquely above lateral line. Colour: back and upper sides vermilion; lower sides and belly silvery with a reddish tinge; faint oblique brown lines corresponding with scale rows above lateral line; narrow horizontal yellow lines on sides below lateral line; dorsal and caudal fins yellowish; anal and pelvic fins whitish.

Geographical Distribution : Tropical western Atlantic Ocean extending northward to North Carolina and south to about Rio de Janeiro. Particularly abundant off eastern Florida, Georgia, the Carolinas, and in the Gulf of Campeche.

Habitat and Biology : Found in moderately deep waters, most commonly over rocky bottom near the edge of the continental and island shelves. Young specimens occur in shallower depths (below 25 m). Often forms large schools, particularly the young. Feeds on fishes, shrimps, crabs, polychaetes, other benthic invertebrates, cephalopods and planktonic organisms. Spawning occurs over most of the year with peak activity during spring and summer, at least in the northern part of the range (Puerto Rico to the Carolinas). Estimated maximum age: 10 years.

Size : Maximum total length about 60 cm; common to 35 cm. Matures at about 19 cm.

Interest to Fisheries : This species may have potential as a source of fishmeal, although the flesh is of good quality. Caught mainly with simple or multiple handlines and traps; occasionally large numbers of primarily young specimens are taken with beam trawls. Marketed fresh and frozen.

Local Names : COLOMBIA: Camaronero, Pargo colorado; CUBA: Cazón de lo alto, Cotorro; MARTINIQUE: Ti-yeux; MEXICO: Besugo; PUERTO RICO: Besugo, Rubio, Tumaro; VENEZUELA: Cunaro.

Literature : Jordan & Evermann (1896); Anderson (1967); Fischer (ed.) (1978); Uyeno et al. (1983).

Symphorichthys Munro, 1967

LUT Sympho

Genus : Symphorichthys Munro, 1967:310. Type-species Mesoprion nematophorus Bleeker, 1860, by original designation.

Synonyms : None.

A single species in the genus - see Symphorichthys spilurus.

Symphorichthys spilurus (Günther, 1874)

LUT Sympho 1

Symphorus spilurus Günther, 1874, Journ.Mus.Godeffroy, 2-3 (5-6):61 (Pelew Islands).

Synonyms : None.

FAO Names : En - Sailfin snapper; Fr - Vivaneau voilier; Sp - Pargo velero.

See Plate XXVIII, 102, 102a juvenile

Diagnostic Features : Body deep, laterally compressed. Head profile rounded with an angular forehead and a steep snout; preorbital bone broader than eye; preopercular notch and knob absent; mouth reaching below front part of eye; upper jaw with a row of submolar teeth, lower jaw with about 3 rows of smaller submolars; also front of both jaws with an outer row of short conical canines, slightly larger than the other teeth; vomer toothless; gill rakers on lower limb of first arch (including rudiments) 4 to 6; total rakers on first arch 14 or 15. Dorsal fin with 10 spines and 14 to 18 soft rays; anal fin with 3 spines and 8 to 11 soft rays; one or more anterior soft rays of dorsal and anal fins produced into long filaments; pectoral fin long, reaching level of anus or beyond, with 16 rays; caudal fin emarginate. Scales moderate-sized, about 53 to 59 in lateral line; scale rows on back parallel to lateral line. Colour: overall yellowish, with a series of bright blue stripes on sides and head; a prominent black spot with a pale margin on upper edge of caudal peduncle. Juveniles light brown above and white below with broad black stripe along middle of sides.

Geographical Distribution : Western margin of the tropical Pacific Ocean including New Caledonia, the Great Barrier Reef of Australia, New Guinea, Admiralty Islands, Palau Islands, the Philippines, and the Ryukyu Islands; also known from Rowley Shoals in the eastern Indian Ocean off Broome, Western Australia.

Habitat and Biology : Found over sand bottoms in the vicinity of coral reefs at depths between about 5 and 60 m. Usually seen solitarily. Feeds on fishes and sand-dwelling crustaceans and molluscs.

Size : Maximum total length about 60 cm; common to 35 cm.

Interest to Fisheries : Occasionally seen in markets, usually fresh. Caught mainly with handlines and bottom trawls.

Local Names : AUSTRALIA: Blue-lined sea-bream; JAPAN: Irezumi-fuedai; PALAU: Edui; THE PHILIPPINES: Darag-darag, Lagan, Malaponte, Maya-maya.

Literature : Fowler (1933); Weber & De Beaufort (1936); Munro (1967); Grant (1982); Masuda et al. (1984).

Symphorus Günther, 1872

LUT Symphor

Genus : Symphorus Günther, 1872:438. Type-species Symphorus taeniolatus Günther, 1872 (= Symphorus nematophorus /Bleeker, 1860/, by original designation.

Synonyms : None.

A single species in the genus - see Symphorus nematophorus.

Symphorus nematophorus (Bleeker, 1860)

LUT Symphor 1

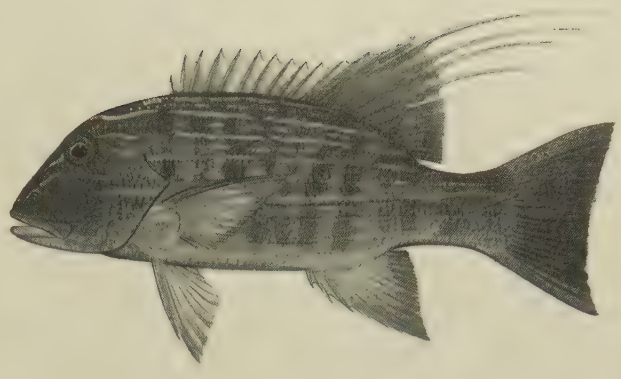
Mesoprion nematophorus Bleeker, 1860, Act.Soc.Sci.Ind.Néerland., 8:56 (Celebes).

Synonyms : (From Munro, 1967) Symphorus taenilatus Günther (1872); Symphorus forsteri Fowler (1933).

FAO Names : En - Chinamanfish; Fr - Vivaneau diable; Sp - Pargo diablo.

See Plate XXVIII, 103

Diagnostic Features : Body deep, laterally compressed. Head profile steep; preorbital bone broader than eye; a deep groove between eye and nostrils; preopercular notch and knob absent; mouth large, extending to below middle of eye; teeth in jaws in narrow bands, with the outer ones enlarged; canine teeth present at front of upper jaw; vomer toothless; tongue with a patch of granular teeth; gill rakers on lower limb of first arch (including rudiments) 13; total rakers on first arch 18. Dorsal fin with 10 spines and 15 or 16 soft rays; anal fin with 3 spines and 9 soft rays; one or more anterior dorsal soft rays produced into long filaments in young specimens; pectoral fins long, reaching level of anus, with 16 rays; caudal fin emarginate. Scales moderate-sized about 49 to 55 in lateral line; scale rows on back parallel to lateral line. Colour: adults mainly reddish, frequently with lighter blotching or transverse bars; young brown on back and upper sides yellowish below with bright blue stripes on side.



juvenile

See Plate XXVIII, 103a

Geographical Distribution : Tropical western Pacific Ocean throughout the Indo-Australian Archipelago (New Guinea and Australia to the Malay Peninsula) and northward to the Ryukyu Islands.

Habitat and Biology : Inhabits coral reefs from shallow water to depths of at least 50 m. Occurs solitarily. Feeds mainly on fishes.

Size : Maximum total length about 80 cm; common to 45 cm.

Interest to Fisheries : Frequently seen in markets, usually fresh. The flesh is excellent eating but in Queensland it is considered dangerous due to ciguatera poiosn. Caught mainly with hook-and-line; also speared by divers.

Local Names : AUSTRALIA: Chinaman-fish; JAPAN: Itohiki-fuedai; NEW CALEDONIA: Bar billon; THE PHILIPPINES: Malaponte, Sampak bakal, Tagpian.

Literature : Fowler (1931); Munro (1967); Grant (1982); Masuda et al. (1984).

3. PROVISIONAL LIST OF NOMINAL SPECIES OF LUTJANIDAE

The following list gives in order (1) the scientific name, as it originally appeared, in alphabetical order according to the specific or subspecific name; (2) the author or authors (in Cuvier & Valenciennes is abbreviated C. & V. and Bloch and Schneider is abbreviated B. & S.); (3) date of publication; (4) present identification; (5) general distribution code in parentheses: EP (eastern Pacific), IP (Indo-West Pacific); EA (eastern Atlantic), WA (western Atlantic).

Lutjanus acutirostris Desmarest, 1823	Lutjanus apodus	(WA)
Diacope adetii Castelnau, 1873	Lutjanus adetii	(IP)
Lutjanus agennes Bleeker, 1863	Lutjanus agennes	(EA)
Diacope alboguttata Valenciennes (in C. & V.), 1828	Lutjanus rivulatus	(IP)
Bodianus albostriatus B. & S., 1801	Lutjanus apodus	(WA)
Rooseveltia aloha Jordan & Snyder, 1907	Pristipomoides zonatus	(IP)
Lutjanus altifrontalis Chan, 1970	Lutjanus erythropterus	(IP)
Genyoroge amabilis DeVis, 1885	Lutjanus adetii	(IP)
Mesoprion ambiguus Poey, 1860	Lutjanus ambiguus	(WA)
Diacope amboinensis Bleeker, 1852	Lutjanus boutton	(IP)
Platyinius amoenus Snyder, 1911	Pristipomoides argyrogrammicus	(IP)
Diacope analis Valenciennes (in C. & V.), 1830	Lutjanus fulvus	(IP)
Mesoprion analis Cuvier (in C. & V.), 1828	Lutjanus analis	(WA)
Pristipomoides andersoni Ginsburg, 1952	Pristipomoides aquilonaris	(WA)
Diacope angulus Bennett, 1831	Lutjanus notatus	(IP)
Mesoprion annularis Cuvier (in C. & V.), 1828	Lutjanus erythropterus	(IP)
Perca apoda Walbaum, 1792	Lutjanus apodus	(WA)
Anthias aquilonaris Goode & Bean, 1896	Pristipomoides aquilonaris	(WA)
Mesoprion aratus Günther, 1864	Lutjanus aratus	(EP)
Sciaena argentata Gmelin, 1789	Lutjanus argentimaculatus	(IP)
Mesoprion argenteus Hombron & Jacquinot, 1853	Lutjanus fulvus	(IP)
Sciaena argentimaculatus Forsskål, 1775	Lutjanus argentimaculatus	(IP)
Mesoprion argentiventrus Peters, 1869	Lutjanus argentiventris	(EP)
Serranus argyrogrammicus Valenciennes (in C. & V.), 1831	Pristipomoides argyrogrammicus	(IP)
Aprion ariommus Jordan & Gilbert, 1883	Rhomboplites aurorubens	(WA)
Mesoprion arnillo Poey,1860	Apsilus dentatus	(WA)
Lutjanus aubrieti Desmarest, 1832	Lutjanus synagris	(WA)
Diacope aurantiaca Valenciennes (in C. & V.), 1830	Lutjanus fulvus	(IP)
Mesoprion aureovittatus Macleay, 1879	Lutjanus fulviflamma	(IP)
Arnillo auricilla Jordan, Evermann & Tanaka, 1927	Pristipomoides auricilla	(IP)
Mesoprion auro-lineatus Cuvier (in C. & V.), 1830	Lutjanus fulviflamma	(IP)
Centropristis aurorubens Cuvier (in C. & V.,), 1829	Rhomboplites aurorubens	(WA)
Mesoprion aurovittatus Agassiz, 1829	Ocyurus chrysurus	(WA)
Diacope axillaris Valenciennes (in C. & V.), 1830	Lutjanus gibbus	(IP)
Holocentrus bengalensis Bloch, 1790	Lutjanus bengalensis	(IP)
Genyoroge bidens Macleay, 1883	Lutjanus gibbus	(IP)
Serranus biguttatus Valenciennes (in C. & V.), 1830	Lutjanus biguttatus	(IP)
Diacope bitaeniatus Valenciennes (in C. & V.), 1830	Lutjanus bitaeniatus	(IP)
Lutjanus blackfordi Goode & Bean, 1879	Lutjanus campechanus	(WA)
Lutjanus Blochii Lacepède, 1802	Lutjanus lutjanus	(IP)
Sciaena bohar Forsskål, 1775	Lutjanus bohar	(IP)
Diacope borensis Cuvier (in C. & V.), 1828	Lutjanus gibbus	(IP)
Diacope bottonensis Cuvier (in C. & V.), 1828	Lutjanus boutton	(IP)
Holocentrus boutton Lacepède, 1803	Lutjanus boutton	(IP)
Etelis brevirostris Vaillant, 1873	Pristipomoides filamentosus	(IP)
Serranus brighami Seale, 1901	Pristipomoides zonatus	(IP)
Mesoprion buccanella Cuvier (in C. & V.), 1828	Lutjanus buccanella	(WA)
Anthias caballerote B. & C., 1801	Lutjanus griseus	(WA)
Apharues caerulescens Cuvier (in C. & V.), 1830	Aphareus furcatus	(IP)
Vegetichthys caeruleus Katayama, 1934	Paracaesio caeruleus	(IP)
Diacope calveti Cuvier (in C. & V.), 1828	Lutjanus timorensis	(IP)
Mesoprion campechanus Poey, 1860	Lutjanus campechanus	(WA)
Lutjanus campechianus Poey, 1875	Lutjanus campechanus	(WA)
Aetiasis cantharoides Barnard, 1937	Paracaesio xanthurus	(IP)
Etelis carbunculus Cuvier (in C. & V.), 1828	Etelis carbunculus	(IP)
Tangia carnolabrum Chan, 1970	Lipocheilus carnolabrum	(IP)
Mesoprion caroui Cuvier (in C. & V.), 1831	Lutjanus lutjanus	(IP)
Mesoprion carponotatus Richardson, 1842	Lutjanus carponotatus	(IP)

Lutjanus castelnaui Whitley, 1928	Lutjanus adetii	(IP)
Coius catus Buchanan, 1822	Lutjanus johnii	(IP)
Mesoprion caudalis Valenciennes (in C. & V.), 1830	Lutjanus lunulatus	(IP)
Mesoprion caudanotatus Poey, 1851	Lutjanus buccanella	(WA)
Sparus caxis B. & S., 1801	Lutjanus apodus	(WA)
Mesoprion chirtah Cuvier (in C. & V.), 1828	Lutjanus erythropterus	(IP)
Mesoprion chrysotaenia Bleeker, 1851	Lutjanus carponotatus	(IP)
Sparus chrysurus Bloch, 1790	Ocyurus chrysurus	(WA)
Diacope civis Valenciennes (in C. & V.), 1831	Lutjanus sebae	(IP)
Lutjanus coatesi Whitley, 1934	Lutjanus bohar	(IP)
Diacope coccinea Cuvier (in C. & V.), 1828	Lutjanus gibbus	(IP)
Diacope coeruleo-lineata Rüppell, 1835	Lutjanus coeruleolineatus	(IP)
Diacope coeruleo-punctata Cuvier (in C. & V), 1828	Lutjanus rivulatus	(IP)
Diacope coeruleovittata Valenciennes (in C. & V.), 1830	Lutjanus notatus	(IP)
Lutjanus colorado Jordan & Gilbert, 1881	Lutjanus colorado	(EP)
Lutjanus comoriensis Fourmanoir, 1957	Lutjanus gibbus	(IP)
Etelis coruscans Valenciennes, 1862	Etelis coruscans	(IP)
Lutjanus cubera Poey, 1871	Lutjanus cyanopterus	(WA)
Mesoprion cyanopterus Cuvier (in C. & V.), 1828	Lutjanus cyanopterus	(WA)
Mesoprion cynodon Cuvier (in C. & V.), 1828	Lutjanus apodus	(WA)
Diacope decemlineata Valenciennes (in C. & V.), 1830	Lutjanus quinquelineatus	(IP)
Mesoprion decussatus Cuvier (in C. & V.), 1828	Lutjanus decussatus	(IP)
Apsilus dentatus Guichenot, 1853	Apsilus dentatus	(WA)
Mesoprion dentatus Duméril, 1858	Lutjanus dentatus	(EA)
Mesoprion dodecacanthoides Bleeker, 1854a	Lutjanus dodecacanthoides	(IP)
Mesoprion dodecacanthus Bleeker, 1853	Lutjanus malabaricus	(IP)
Chaetopterus dubius Günther, 1859	Pristipomoides sieboldii	(IP)
Diacope duodecemlineata Valenciennes (in C. & V.), 1830	Lutjanus notatus	(IP)
Lutianus ehrenbergii Peters, 1869	Lutjanus ehrenbergii	(IP)
Mesoprion elegans Poey, 1860	Rhomboplites aurorubens	(WA)
Mesoprion elongatus Hombron & Jacquinot, 1852	Lutjanus biguttatus	(IP)
Sparopsis elongatus Kner, 1868	Aprion virescens	(IP)
Lobotes emarginatus Baird & Girard, 1855	Lutjanus griseus	(WA)
Lutjanus endecacanthus Bleeker, 1863a	Lutjanus endecacanthus	(EA)
Mesoprion enneacanthus Bleeker, 1849	Lutjanus vitta	(IP)
Diacope erythrina Rüppell, 1838	Lutjanus sanguineus	(IP)
Mesoprion erythrognathus Valenciennes (in C. & V.), 1831	Lutjanus lutjanus	(IP)
Lutjanus erythropterus Bloch, 1790	Lutjanus erythropterus	(IP)
Mesoprion etaape Lesson, 1830	Lutjanus kasmira	(IP)
Lutjanus eutactus Bleeker, 1863a	Lutjanus dentatus	(EA)
Etelis evurus Jordan & Evermann, 190	Etelis coruscans	(IP)
Bodianus fasciatus B. & S., 1801	Lutjanus apodus	(WA)
Etelis filamentosus Fourmanoir, 1970	Randallichthys filamentosus	(IP)
Serranus filamentosus Valenciennes (in C. & V.), 1830	Pristipomoides filamentosus	(IP)
Mesoprion flavescens Cuvier (in C. & V.), 1828	Lutjanus apodus	(WA)
Diacope flavipes Valenciennes (in C. & V.), 1830	Lutjanus fulvus	(IP)
Mesoprion flavipinnis Cuvier (in C. & V.), 1828	Lutjanus argentimaculatus	(IP)
Pristipomoides flavipinnis Shinohara, 1963	Pristipomoides flavipinnis	(IP)
Mesoprion flaviroseus DeVis, 1884	Lutjanus boutton	(IP)
Aphareus flavivultus Jenkins, 1901	Aphareus furcatus	(IP)
Symphorus forsteri Fowler, 1933	Symphorus nematophorus	(IP)
Pristipomoides freemani Anderson, 1966	Pristipomoides freemani	(WA)
Mesoprion fulgens Valenciennes (in C. & V.), 1830	Lutjanus fulgens	(EA)
Sciaena fulviflamma Forsskål, 1775	Lutjanus fulviflamma	(IP)
Holocentrus fulvus Schneider (in B. & S.), 1801	Lutjanus fulvus	(IP)
Labrus furcatus Lacepède, 1802	Aphareus furcatus	(IP)
Lutianus furvicaudatus Fowler, 1904	Lutjanus lemniscatus	(IP)
Mesoprion fuscescens Valenciennes (in C. & V.), 1830	Lutjanus fuscescens	(IP)
Apsilus fuscus Valenciennes (in C. & V.), 1830	Apsilus fuscus	(EA & IP)
Mesoprion gaimardi Bleeker, 1859	Lutjanus fulvus	(IP)
Mesoprion garretti Günther, 1873	Lutjanus argentimaculatus	(IP)
Alphestes gembra Schneider (in B. & S.), 1801	Lutjanus argentimaculatus	(IP)
Sciaena gibba Forsskål, 1775	Lutjanus gibbus	(IP)
Mesoprion goldiei Macleay, 1882	Lutjanus goldiei	(IP)
Paracaesio gonzalesi Fourmanoir & Rivaton, 1979	Paracaesio gonzalesi	(IP)
Mesoprion goreensis Valenciennes (in C. & V.), 1830	Lutjanus goreensis	(EA)
Genyoroge grammica Day, 1870	Lutjanus quinquelineatus	(IP)
Mesoprion griseoides Guichenot, 1862	Lutjanus argentimaculatus	(IP)
Labrus griseus Linnaeus, 1758	Lutjanus griseus	(WA)
Lutjanus guilcheri Fourmanoir, 1959	Lutjanus guilcheri	(IP)

Lutjanus guineensis Bleeker, 1863	Lutjanus goreensis (EA)
Hoplopagrus guntheri Gill, 1862	Hoplopagrus guntheri (EP)
Mesoprion guttatus Steindachner, 1869	Lutjanus guttatus (EP)
Centropomus hober Lacepède, 1803	Lutjanus fulviflamma (IP)
Mesoprion hoteen Richardson, 1846	Lutjanus fuscescens (IP)
Diacope immaculata Cuvier (in C. & V.), 1828	Lutjanus fulvus (IP)
Mesoprion immaculatus Cuvier (in C. & V.), 1828	Lutjanus lemniscatus (IP)
Mesoprion inermis Peters, 1869	Lutjanus inermis (EP)
Mesoprion isodon Valenciennes (in C. & V.), 1833	Lutjanus analis (WA)
Mesoprion janthinuropterus Bleeker, 1852a	Lutjanus lemniscatus (IP)
Mesoprion janthinurus Bleeker, 1854	Lutjanus gibbus (IP)
Anthias jocu B. & S., 1801	Lutjanus jocu (WA)
Anthias johnii Bloch, 1792	Lutjanus johnii (IP)
Lutianus jongarah Day, 1875	Lutjanus argentimaculatus (IP)
Neomaensis jordani Gilbert, 1897	Lutjanud jordani (EP)
Mesoprion kagoshima Steindachner & Doederlein, 1883	Lutjanus fulvus (IP)
Aprion kanekonis Tanaka, 1935	Pristipomoides filamentosus (IP)
Sciaena kasmira Forsskål, 1775	Lutjanus kasmira (IP)
Paracaesio kusakarii Abe, 1960	Paracaesio kusakarii (IP)
Diacope labuan Thiollière, 1856	Lutjanus bohar (IP)
Sparopsis latifrons Kner, 1868	Aprion virescens (IP)
Serranus lemniscatus Valenciennes (in C. & V.), 1828	Lutjanus lemniscatus (IP)
Mesoprion linea Cuvier (in C. & V.), 1828	Lutjanus apodus (WA)
Diacope lineata Quoy & Gaimard, 1824	Lutjanus gibbus (IP)
Diacope lineolata Rüppell, 1829	Lutjanus lutjanus (IP)
Lutjanus lioglossus Bleeker, 1873	Lutjanus monostigma (IP)
Mesoprion litura Cuvier (in C. & V.), 1828	Lutjanus jocu (WA)
Lutjanus longmani Whitley, 1937	Lutjanus erythropterus (IP)
Perca lunulata Park, 1797	Lutjanus lunulatus (IP)
Lutjanus lutjanus Bloch, 1790	Lutjanus lutjanus (IP)
Lutianus luzonius Evermann & Seale, 1906	Lutjanus boutton (IP)
Genyoroge macleayana Ramsay, 1883	Lutjanus erythropterus (IP)
Diacope macolor Lesson, 1827	Macolor niger (IP)
Centropristes macrophthalmus Müller & Troschel, 1848	Pristipomoides macrophthalmus (WA)
Macolor macularis Fowler, 1931	Macolor macularis (IP)
Mesoprion madras Valenciennes (in C. & V.), 1831	Lutjanus madras (IP)
Mesoprion mahogoni Cuvier (in C. & V.), 1828	Lutjanus mahogoni (WA)
Sparus malabaricus Schneider (in B. & S.), 1801	Lutjanus malabaricus (IP)
Lutjanus maltzani Steindachner, 1882	Lutjanus fulgens (EA)
Diacope marginata Cuvier (in C. & V.), 1828	Lutjanus fulvus (IP)
Lutjanus marginatoides Kendall & Goldsborough, 1911	Lutjanus fulvus (IP)
Mesoprion marginipinnis Macleay, 1883	Lutjanus fulvus (IP)
Eteliscus marshi Jenkins, 1903	Etelis carbunculus (IP)
Mesoprion maus Thiollière, 1856	Lutjanus fulvus (IP)
Lutjanus maxweberi Popta, 1921	Lutjanus maxweberi (IP)
Neomaensis megalophthalmus Evermann & Marsh, 1900	Lutjanus synagris (WA)
Rhomboplitoides megalops Fowler, 1918	Lutjanus lutjanus (IP)
Lutjanus melanurus Jordan & Gilbert, 1883	Ocyurus chrysurus (WA)
Mesoprion melanospilos Bleeker, 1852a	Lutjanus boutton (IP)
Lutjanus melanotaenia Bleeker, 1863	Lutjanus lemniscatus (IP)
Diacope melanura Rüppell, 1838	Lutjanus gibbus (IP)
Mesoprion microchir Bleeker, 1853	Aprion virescens (IP)
Aprion microdon Steindachner, 1876	Pristipomoides filamentosus (IP)
Chaetopterus microlepis Bleeker, 1869a	Pristipomoides filamentosus (IP)
Mesoprion mitchelli Günther, 1867	Pinjalo pinjalo (IP)
Lutjanus mizenkoi Allen & Talbot, 1985	Lutjanus mizenkoi (IP)
Lutjanus modestus Bleeker, 1863	Lutjanus agennes (EA)
Mesoprion monostigma Cuvier (in C. & V.), 1828	Lutjanus monostigma (IP)
Mesoprion multidens Day, 1870	Pristipomoides multidens (IP)
Mesoprion myriaster Liénard, 1839	Lutjanus rivulatus (IP)
Mesoprion nematophorus Bleeker, 1860	Symphorus nematophorus (IP)
Sciaena nigra Forsskål, 1775	Macolor niger (IP)
Genyoroge nigricauda DeVis, 1885	Lutjanus fulvus (IP)
Lutjanus nishikawae Smith & Pope, 1907	Lutjanus russelli (IP)
Diacope notatus Cuvier (in C. & V.), 1828	Lutjanus notatus (IP)
Serranus nouleny Valenciennes (in C. & V.), 1828	Lutjanus lutjanus (IP)
Lutjanus novemfasciatus Gill, 1862	Lutjanus novemfasciatus (EP)
Etelis nudimaxillaris Yoshino & Araga, 1975	Randallichthys filamentosus (IP)
Lutianus nukuhivae Seale, 1906	Lutjanus bohar (IP)
Mesoprion obscurus Macleay, 1881	Lutjanus argentimaculatus (IP)

Diacope octolineata Cuvier (in C. & V.), 1828	Lutjanus kasmira (in part)	(IP)
	Lutjanus bengalensis (in part)	(IP)
Lutjanus octolineatus Fourmanoir, 1957	Lutjanus notatus	(IP)
Diacope octovittata Cuvier (in C. & V.), 1830	Lutjanus bengalensis	(IP)
Etelis oculatus Valenciennes (in C. & V.), 1828	Etelis oculatus	(WA)
Mesoprion ojanco Poey, 1860	Lutjanus mahogoni	(WA)
Lutjanus oligolepis Bleeker, 1873	Lutjanus ehrenbergii	(IP)
Mesoprion olivaceus Cuvier (in C. & V.), 1828	Lutjanus argentimaculatus	(IP)
Mesoprio Ophuysenii Bleeker, 1860	Lutjanus vitta	(IP)
Lutjanus orientalis Seale, 1909	Lutjanus russelli	(IP)
Mesoprion pacificus Bocourt, 1868	Lutjanus novemfasciatus	(EP)
Lutjanus paravitta Postel, 1966	Lutjanus adetii	(IP)
Mesoprion pargus Cuvier (in C. & V.), 1828	Lutjanus cyanopterus	(WA)
Mesoprion parvidens Macleay, 1883	Lutjanus rivulatus	(IP)
Serranus pavoninus Valenciennes (in C. & V.), 1828	Lutjanus johnii	(IP)
Paracaesio pedleyi McCulloch & Waite, 1916	Paracaesio xanthurus	(IP)
Neomaenis peru Nichols & Murphy, 1922	Lutjanus peru	(EP)
Mesoprion phaiotaeniatus Bleeker, 1849	Lutjanus vitta	(IP)
Caesio pinjalo Bleeker, 1850	Pinjalo pinjalo	(IP)
Mesoprion pomacanthus Bleeker, 1855	Lutjanus bengalensis (in part)	(IP)
	Lutjanus kasmira (in part)	(IP)
Lutjanus prieto Jordan & Gilbert, 1881	Lutjanus novemfasciatus	(EP)
Mesoprion profundus Poey, 1860	Lutjanus vivanus	(WA)
Lutjanus purpureus Poey, 1867	Lutjanus purpureus	(WA)
Diacope quadriguttata Cuvier (in C. & V.), 1828	Lutjanus bohar	(IP)
Mesoprion quadripunctatus Günther, 1859	Lutjanus rivulatus	(IP)
Holocentrus quinquelinearis Bloch, 1790	Lutjanus quinquelineatus	(IP)
Holocentrus quinquelineatus Bloch, 1790	Lutjanus quinquelineatus	(IP)
Anthias rabirubia B. & S., 1801	Ocyurus chrysurus	(WA)
Etelis radiosus Anderson, 1981	Etelis radiosus	(IP)
Mesoprion rangus Cuvier (in C. & V.), 1828	Lutjanus bohar	(IP)
Genyoroge regia DeVis, 1885	Lutjanus sebae	(IP)
Mesoprion retrospinis Valenciennes (in C. & V.), 1830	?	(IP)
Diacope revulina Swainson, 1839	Lutjanus rivulatus	(IP)
Mesoprion ricardi Cuvier (in C. & V.), 1828	Lutjanus mahogoni	(WA)
Ocyurus rijgersmoei Cope, 1871	Ocyurus chrysurus	(WA)
Diacope rivulata Cuvier (in C. & V.), 1828	Lutjanus rivulatus	(IP)
Mesoprion rosaceus Poey, 1870	Lutjanus analis	(WA)
Diacope rosea Valenciennes (in C. & V.), 1830	Lutjanus gibbus	(IP)
Mesoprion roseigaster Macleay, 1881	Lutjanus argentimaculatus	(IP)
Aphareus roseus Castelnau, 1879	Pristipomoides filamentosus	(IP)
Mesoprion rubellus Cuvier (in C. & V.), 1828	Lutjanus erythropterus	(IP)
Mesoprion rubens Macelay, 1882	Lutjanus bohar	(IP)
Diacope rufolineata Valenciennes (in C. & V.), 1828	Lutjanus boutton	(IP)
Mesoprion russelli Bleeker, 1849	Lutjanus russelli	(IP)
Aphareus rutilans Cuvier (in C. & V.), 1830	Aphareus rutilans	(IP)
Caranxomorus sacrestinus Lacepède, 1803	Aphareus furcatus	(IP)
Lutianus salmonoides Gilchrist & Thompson, 1908	Lutjanus argentimaculatus	(IP)
Diacope sanguinea Cuvier (in C. & V.), 1828	Lutjanus sanguineus	(IP)
Diacope sebae Cuvier (in C. & V.), 1828	Lutjanus sebae	(IP)
Lutjanus semicinctus Quoy & Gaimard, 1824	Lutjanus semicinctus	(IP)
Sparus semiluna Lacepède, 1803	Ocyurus chrysurus	(WA)
Mesoprion sexfasciatus Macleay, 1883	Lutjanus argentimaculatus	(IP)
Genyoroge notata var. sexlineata Kent, 1893	Lutjanus quinquelineatus	(IP)
Diacope siamensis Valenciennes (in C. & V.), 1830	Lutjanus sebae	(IP)
Chaetopterus sieboldii Bleeker, 1857	Pristipomoides sieboldii	(IP)
Diacope sinal Thiollière, 1857	Lutjanus rivulatus	(IP)
Mesoprion sobra Cuvier (in C. & V.), 1828	Lutjanus analis	(WA)
Paracaesio sordidus Abe & Shinohara, 1962	Paracaesio sordidus	(IP)
Diacope sparus Temminck & Schlegel, 1842	Pristipomoides multidens	(IP)
Diacope spilura Bennett, 1832	Lutjanus quinquelineatus	(IP)
Symphorus spilurus Günther, 1874	Symphorichthys spilurus	(IP)
Pristipomoides squamimaxillaris Kami, 1973	Parapristipomoides squamimaxillaris	(IP)
Lutjanus steransii Goode & Bean, 1878	Lutjanus griseus	(WA)
Lutjanus stellatus Akazaki, 1983	Lutjanus stellatus	(IP)
Paracaesio stonei Raj & Seeto, 1983	Paracaesio stonei	(IP)
Diacope striata Cuvier (in C. & V.), 1828	Lutjanus gibbus	(IP)
Bodianus striatus B. & S., 1801	Lutjanus apodus	(WA)
Genyoroge notata var. sublineata DeVis, 1885	Lutjanus quinquelineatus	(IP)
Diacope superbus Castelnau, 1878	Lutjanus argentimaculatus	(IP)

Sparus synagris Linnaeus, 1758	Lutjanus synagris	(WA)
Symphorus taeniolatus Günther, 1872	Symphorus nematophorus	(IP)
Mesoprion taeniops Valenciennes (in C. & V.), 1830	Lutjanus argentimaculatus	(IP)
Lutianus tahitiensis Seale, 1906	Lutjanus gibbus	(IP)
Serranus telfairi Bennett, 1831	Pristipomoides zonatus	(IP)
Mesoprion terubuan Thiollière, 1856	Lutjanus fulviflamma	(IP)
Sparus tetracanthus Bloch, 1791	Lutjanus griseus	(WA)
Mesoprion therapon Day, 1869	Lutjanus decussatus	(IP)
Aphareus thompsoni Fowler, 1923	Aphareus rutilans	(IP)
Diacope tiea Lesson, 1830	Lutjanus gibbus	(IP)
Diacope timorensis Quoy & Gaimard, 1824	Lutjanus timorensis	(IP)
Lutjanus torridus Cope, 1871	Lutjanus vivanus	(WA)
Sparus tranquebaricus Shaw, 1803	Lutjanus johnii	(IP)
Vegetichthys tumidus Tanaka, 1917	Paracaesio xanthurus	(IP)
Macolor typus Bleeker, 1867	Macolor niger	(IP)
Pristipomoides typus Bleeker, 1852	Pristipomoides typus	(IP)
Bowersia ulaula Jordan & Evermann, 1903	Pristipomoides sieboldii	(IP)
Genyoroge unicolor Alleyne & Macleay, 1877	Lutjanus adetii	(IP)
Lutjanus unimaculatus Quoy & Gaimard, 1824	Lutjanus fulviflamma	(IP)
Mesoprion uninotatus Cuvier (in C. & V.), 1828	Lutjanus synagrus	(WA)
Diacope vaigiensis Quoy & Gaimard, 1824	Lutjanus fulvus	(IP)
Sparus vermicularus B. & S., 1801	Lutjanus synagris	(WA)
Bowersia violescens Jordan & Evermann, 1903	Pristipomoides filamentosus	(IP)
Aprion virescens Valenciennes (in C. & V.), 1830	Aprion virescens	(IP)
Diacope viridis Valenciennes, 1845	Lutjanus viridis	(EP)
Diacope vitianus Hombron & Jacquinot, 1853	Lutjanus boutton	(IP)
Serranus vitta Quoy & Gaimard, 1824	Lutjanus vitta	(IP)
Bodianus vivanet Lacepède, 1803	Lutjanus griseus	(WA)
Mesoprion vivanus Cuvier (in C. & V.), 1828	Lutjanus vivanus	(WA)
Mesoprion xanthopterygius Bleeker, 1849	Lutjanus lutjanus	(IP)
Diacope xanthopus Cuvier (in C. & V.), 1829	Lutjanus fulvus	(IP)
Diacope xanthozona Bleeker, 1845	Lutjanus johnii	(IP)
Caesio xanthurus Bleeker, 1869	Paracaesio xanthurus	(IP)
Mesoprion yapilli Cuvier (in C. & V.), 1828	Lutjanus johnii	(IP)
Serranus zonatus Valenciennes (in C. & V.), 1830	Pristipomoides zonatus	(IP)

4. LIST OF SPECIES BY MAJOR FISHING AREAS

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																	
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Aphareus furcatus	18											●	●		●		●	●			
Aphareus rutilans	19											●	●		●		●	●			
Aprion virescens	20											●	●		●		●	●			
Apsilus dentatus	22					●															
Apsilus fuscus	23						●			●											
Etelis carbunculus	26											●	●		●		●	●			
Etelis coruscans	27											●	●		●		●	●			
Etelis oculatus	28					●			●												
Etelis radiosus	29											●	●		●		●	●			
Hoplopagrus guntheri	30																	●			
Lipocheilus carnolabrum	32											●	●		●		●				
Lutjanus adetii	52																●		●		
Lutjanus agennes	53						●			●											

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																			
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Lutjanus ambiguus	54					●															
Lutjanus analis	55					●			●												
Lutjanus apodus	56					●			●												
Lutjanus aratus	57																●				
Lutjanus argentimaculatus	58											●	●		●		●	●			
Lutjanus argentiventris	60																	●		●	
Lutjanus bengalensis	61											●	●				●				
Lutjanus biguttatus	62											●	●				●				
Lutjanus bitaeniatus	63												●								
Lutjanus bohar	64											●	●		●		●	●			
Lutjanus boutton	66												●		●		●	●			
Lutjanus buccanella	67					●															
Lutjanus campechanus	68					●															
Lutjanus carponotatus	69												●				●				

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																	
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Lutjanus coeruleolineatus	70											●									
Lutjanus colorado	71																	●			
Lutjanus cyanopterus	72					●			●												
Lutjanus decussatus	73											●	●		●		●				
Lutjanus dentatus	74						●			●											
Lutjanus dodecacanthoides	75																●				
Lutjanus ehrenbergii	76											●	●		●		●				
Lutjanus endecacanthus	77						●			●											
Lutjanus erythropterus	78											●	●		●		●				
Lutjanus fulgens	79						●			●											
Lutjanus fulviflamma	80											●	●		●		●	●			
Lutjanus fulvus	82											●	●		●		●	●			
Lutjanus fuscescens	83	●															●				
Lutjanus gibbus	84											●	●		●		●	●			

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																			
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Lutjanus goldiei	86	●															●				
Lutjanus goreensis	87						●			●											
Lutjanus griseus	88					●			●												
Lutjanus guilcheri	89											●	●								
Lutjanus guttatus	90																	●		●	
Lutjanus inermis	92																	●			
Lutjanus jocu	92					●			●												
Lutjanus johnii	94											●	●		●		●				
Lutjanus jordani	95																	●		●	
Lutjanus kasmira	96											●	●		●		●	●			
Lutjanus lemniscatus	97											●	●				●				
Lutjanus lunulatus	98											●	●				●				
Lutjanus lutjanus	99											●	●		●		●				
Lutjanus madras	100											●	●		●		●				

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																	
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Lutjanus mahogoni	101					●															
Lutjanus malabaricus	102											●	●		●		●		●		
Lutjanus maxweberi	103	●															●				
Lutjanus mizenkoi	105																●	●			
Lutjanus monostigma	106											●	●		●		●	●			
Lutjanus notatus	107											●									
Lutjanus novemfasciatus	108																	●		●	
Lutjanus peru	109																	●		●	
Lutjanus purpureus	110					●			●												
Lutjanus quinquelineatus	111											●	●		●		●		●		
Lutjanus rivulatus	112											●	●		●		●	●			
Lutjanus russelli	113											●	●		●		●				
Lutjanus sanguineus	115											●									
Lutjanus sebae	116											●	●		●		●		●		

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																			
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Lutjanus semicinctus	117																●	●			
Lutjanus stellatus	118														●						
Lutjanus synagris	119					●			●												
Lutjanus timorensis	121												●				●				
Lutjanus viridis	122																	●			
Lutjanus vitta	123											●	●		●		●				
Lutjanus vivanus	124					●															
Macolor macularis	126												●		●		●				
Macolor niger	127											●	●		●		●	●			
Ocyurus chrysurus	129					●															
Paracaesio caeruleus	132														●						
Paracaesio gonzalesi	133																●				
Paracaesio kusakarii	134														●		●	●			
Paracaesio sordidus	135											●	●		●		●	●			

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																			
		FRESH-WATERS	MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
			18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Paracaesio stonei	136														●		●				
Paracaesio xanthurus	137											●	●		●		●	●			
Parapristipomoides squamimaxillaris	138																●				
Pinjalo pinjalo	139											●	●		●		●				
Pinjalo sp.	140											●	●		●		●				
Pristipomoides aquilonaris	144					●															
Pristipomoides argyrogrammicus	145														●		●	●			
Pristipomoides auricilla	146												●		●		●	●			
Pristipomoides filamentosus	147											●	●		●		●	●			
Pristipomoides flavipinnis	149														●		●	●			
Pristipomoides freemani	150					●															
Pristipomoides macrophthalmus	151					●															
Pristipomoides multidens	152											●	●		●		●	●			
Pristipomoides sieboldii	153											●	●		●		●	●			

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
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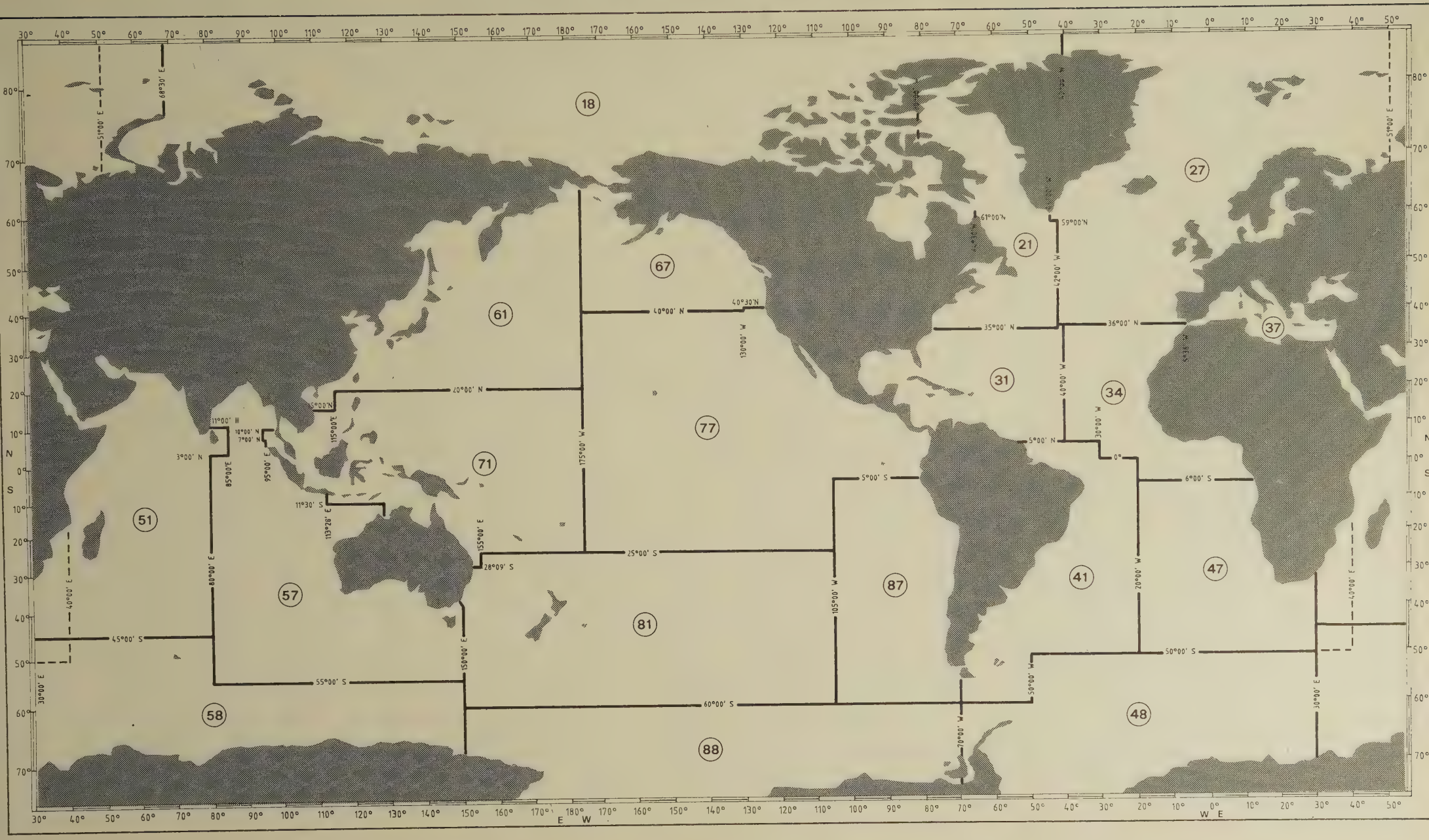
Pristipomoides typus	154											●	●		●		●				
Pristipomoides zonatus	155											●	●		●		●	●			
Randallichthys filamentosus	156														●		●	●			
Rhomboplites aurorubens	157					●			●												
Symphorichthys spilurus	158												●		●		●				
Symphorus nematophorus	160														●		●				

MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES



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6. INDEX OF SCIENTIFIC AND VERNACULAR NAMES

EXPLANATION OF THE SYSTEM

The index applies exclusively to species accounts under Section 2 (Systematic Catalogue)

Type faces used:

Italics : Valid scientific names (genera and species)

: Synonyms (preceded by an asterisk)

Roman : International (FAO) and local species names

PAGE

A

* *acutirostris, Lutjanus* 56
* *adetii, Diacope* 52
adetii, Lutjanus 52
Adullu 60
* *Aetiasis* 130
* *Aetiasis cantharoides* 137
African brown snapper 74
African forktail snapper 24
African red snapper 53
Agahon 63
Agawin 83
Agba-on 67,85
Agbaon 154
agennes, Lutjanus 53
Ahaan 65,79,85,103, 117
Alangot 98
* *alboguttata, Diacope* 112
* *albostriatus, Bodianus* 56
Aliso 60
Alongot 124
* *Alphestes gembra* 58
* *altifrontalis, Lutjanus* 78
* *amabilis, Genyoroge* 52
Amarillo snapper 60
Ambiguous snapper 54
ambiguus, Lutjanus 54
* *ambiguus, Mesoprion* 54
* *amboinensis, Diacope* 66
Amime-fuedai 74
* *amoenus, Platynius* 145
Amparana 81
* *analis, Diacope* 82
analis, Lutjanus 55
* *analis, Mesoprion* 55
* *andersoni, Pristipomoides* 144
* *angulus, Diacope* 107
* *annularis, Mesoprion* 78
Anoping 117
* *Anthias aquilonaris* 144
* *Anthias caballerote* 88
* *Anthias jocu* 92
* *Anthias johnii* 94
* *Anthias rabirubia* 129
Aochibiki 21
Aodai 132
Aphareus 18
Aphareus bleuâtre 19
* *Aphareus caerulescens* 18
* *Aphareus flavivultus* 18
Aphareus furcatus 18
* *Aphareus roseus* 147
Aphareus rutilans 19
* *Aphareus thompsoni* 19
* *apoda, Perca* 56
apodus, Lutjanus 56
Aprion 20
Aprion verdâtre 21
* *Aprion ariommus* 157

PAGE

* *Aprion kanekonis* 147
* *Aprion konekonis* 20
* *Aprion microdon* 147
Aprion virescens 20
Apsilu 21
Apsilus dentatus 22
Apsilus fuscus 23
aquamimaxillaris, Parapristipomoides 138
* *aquilonaris, Anthias* 144
aquilonaris, Pristipomoides 144
aratus, Lutjanus 57
* *aratus, Mesoprion* 57
* *argentata, Sciaena* 58
* *argenteus, Mesoprion* 82
argentimaculatus, Lutjanus 58
* *argentimaculatus, Sciaena* 58
argentiventris, Lutjanus 60
* *argentiventris, Mesoprion* 60
argyrogrammicus, Pristipomoides 145
* *argyrogrammicus, Serranus* 145
* *ariommus, Aprion* 157
Arnillo 23,141
* *Arnillo auricilla* 146
* *arnillo, Mesoprion* 22
Asmoodi 85
Asoama 21
* *aubrieti, Lutjanus* 119
* *aurantiaca, Diacope* 82
* *aureovittatus, Mesoprion* 80
* *auricilla, Arnillo* 146
auricilla, Pristipomoides 146
* *auro-lineatus, Mesoprion* 80
* *aurorubens, Centropristis* 157
aurorubens, Rhomboplites 157
* *aurovittatus, Mesoprion* 129
* *axillaris, Diacope* 84

B

Badava 113
Bahaba 81,114
Bakba-an 103
Bala-bala 74
Bambangen 65
Bambangin 60,83
Bambangon 85,98
Bammaroni 54,75
Banda 60
Bar billon 161
Bara-fueda 65
Bara-hime dai 154
Barahoa 60
Barbirrubia 92
Batungal 60
Bengal snapper 61

	PAGE
★ *bengalensis, Holocentrus*	61
bengalensis, Lutjanus	61
★ *Bennet*	33
Besugo	91,158
Besugo laut	154
Biajaiba	120
★ *bidens, Genyoroge*	84
Bigeye snapper	99
biguttatus, Lutjanus	62
★ *biguttatus, Serranus*	62
Bilason	140
Binluan	20
Bisu-gong-buhangin	20
★ *bitaeniata, Diacope*	63
bitaeniatus, Lutjanus	63
Bitilla	81,94,124
Black and white snapper	127
Black beauty	128
Black snapper	22
Black-banded snapper	117
Blackfin snapper	67
★ *blackfordii, Lutjanus*	68
Blackspot snapper	76-77,81
Blacktail snapper	82
★ *bleekeri, Mesoprion*	62
★ *blochii, Lutjanus*	99
Bloed-snapper	115
Blood snapper	115
Blouband snapper	97
Blubberlip snapper	112
Blue and gold snapper	122
Blue snapper	135
Blue-banded sea-perch	112
Blue-lined sea-bream	160
Bluebanded snapper	97
Blueline gindai	146
Blueline snapper	70
Bluestriped snapper	107
Bobotsy	65,81
Bobtsy	103
Boca colorada	61
Boca colorado	61
Boca fuerte	108
★ *Bodianus albostriatus*	56
★ *Bodianus fasciatus*	56
★ *Bodianus striatus*	56
★ *Bodianus vivanet*	88
Boggel-snapper	85
Bohar	65
bohar, Lutjanus	64
★ *bohar, Sciaena*	64
Bolidao	60
★ *borensis, Diacope*	84
★ *bottonensis, Diacope*	66
Bourgeois	117
★ *boutton, Holocentrus*	66
boutton, Lutjanus	66
★ *Bowersia*	141
★ *Bowersia ulaula*	153
★ *Bowersia violescens*	147
★ *brachypterus, Lutjanus*	119
★ *brevirostris, Etelis*	147
Brownstripe red snapper	123
Brownstripe snapper	123
buccanella, Lutjanus	67
★ *buccanella, Mesoprion*	67
Budlatan	117
Buegsang	74
Burara	100

C

	PAGE
Caballerote	89
★ *caballerote, Anthias*	88
Cachucho	29
★ *caerulescens, Aphareus*	18
caeruleus, Paracaesio	132
★ *caeruleus, Vegetichthys*	132
★ *Caesio pinjalo*	139
★ *Caesio xanthurus*	137
Cají	57
★ *calveti, Diacope*	121
Camaronero	158
campechanus, Lutjanus	68
★ *campechanus, Mesoprion*	68
★ *campechianus, Lutjanus*	68
★ *cantharoides, Aetiasis*	137
★ *Caranxomorus sacrestinus*	18
carbunculus, Etelis	26
Cardenal	151
Cardinal snapper	151
carnolabrum, Lipocheilus	32
★ *carnolabrum, Tangia*	32
★ *caroui, Mesoprion*	99
Carpe	81
carponotatus, Lutjanus	69
★ *carponotatus, Mesoprion*	69
★ *castelnaui, Lutjanus*	52
★ *caudalis, Mesoprion*	98
★ *caudanotatus, Mesoprion*	67
★ *caxis, Sparus*	56
Cazón de lo alto	158
★ *Centropomus hober*	80
★ *Centropristes macrophthalmus*	151
★ *Centropristis aurorubens*	157
Cerf-volant	146
★ *Chaetopte*	141
★ *Chaetopterus dubius*	153
★ *Chaetopterus microlepis*	147
★ *Chaetopterus sieboldii*	153
Chali	113
Changu	79,83
Changu-fimbo	21
Changu-kibaba	106
Chazanda	60
Checkered snapper	73
Chillo	125
Chinaman-fish	161
Chinamanfish	160
Chino	120
★ *chirtah, Mesoprion*	78
Chopa negra	23

	PAGE
* *chrysotaenia, Mesoprion*	69
chrysurus, Ocyurus	129
* *chrysurus, Sparus*	129
Chuttommetti	81
Chutton	81
Cioba	130
* *civis, Diacope*	116
* *coatesi, Lutjanus*	64
* *coccinea, Diacope*	84
Cocoa snapper	136
Coconaco	31
* *coeruleo-lineata, Diacope*	70
* *coeruleo-punctata, Diacope*	112
coeruleolineatus, Lutjanus	70
* *coeruleovittata, Diacope*	107
Cojinoba rosada	91
Colas	130
Colas à bandes dorées	152
Colas bagnard	155
Colas dentu	154
Colas drapeau	146
Colas écailleuse	138
Colas élégant	150
Colas fil	147
Colas gos yeux	151
Colas lavande	153
Colas oeil doré	149
Colas orné	145
Colas vorace	144
Colorado	111
Colorado snapper	71
colorado, Lutjanus	71
Common bluestripe snapper	96
* *comoriensis, Lutjanus*	84
coruscans, Etelis	27
Cotorro	158
Crimson jobfish	147
Crimson snapper	78
Cubera	73
Cubera snapper	72
* *cubera, Lutjanus*	72
Cunaro	158
cyanopterus, Lutjanus	72
* *cyanopterus, Mesoprion*	72
* *cynodon, Lutjanus*	72
* *cynodon, Mesoprion*	56

D

	PAGE
Dagbreek-jobvis	148
Dapak	79,83,85,103
Darag-darag	81,106,114,160
Daranq-daraq	60
Dark-tailed sea-perch	98
Dayang-dayang	124
* *decemlineata, Diacope*	111
decussatus, Lutjanus	73
* *decussatus, Mesoprion*	73
dentatus, Apsilus	22
dentatus, Lutjanus	74
* *dentatus, Mesoprion*	74
Derringl	106
Dhialava	21
Dhiula	21
Diabar	54
* *Diacop*	33
* *Diacope adetii*	52
* *Diacope alboguttata*	112
* *Diacope amboinensis*	66
* *Diacope analis*	82
* *Diacope angulus*	107
* *Diacope aurantiaca*	82
* *Diacope axillaris*	84
* *Diacope bitaeniata*	63
* *Diacope borensis*	84
* *Diacope bottonensis*	66
* *Diacope calveti*	121
* *Diacope civis*	116
* *Diacope coccinea*	84
* *Diacope coeruleo-lineata*	70
* *Diacope coeruleo-punctata*	112
* *Diacope coeruleovittata*	107
* *Diacope decemlineata*	111
* *Diacope duodecemilineate*	107
* *Diacope erythrina*	115
* *Diacope flavipes*	82
* *Diacope immaculata*	82
* *Diacope labuan*	64
* *Diacope lineata*	84
* *Diacope lineolata*	99
* *Diacope macolor*	127
* *Diacope marginata*	82
* *Diacope melanura*	84
* *Diacope notatus*	107
* *Diacope octolineata*	61,96
* *Diacope octovittata*	61
* *Diacope quadriguttata*	64
* *Diacope revulina*	112
* *Diacope rivulata*	112
* *Diacope rosea*	84
* *Diacope rufolineata*	66
* *Diacope sanguinea*	115
* *Diacope sebae*	116
* *Diacope siamensis*	116
* *Diacope sinal*	112
* *Diacope sparus*	152
* *Diacope spilura*	111
* *Diacope striata*	84
* *Diacope superbus*	58
* *Diacope tiea*	84
* *Diacope timorensis*	121
* *Diacope vaigiensis*	82
* *Diacope viridis*	122
* *Diacope vitianus*	66
* *Diacope xanthopus*	82
dodecacanthoides, Lutjanus	75
* *dodecacanthoides, Mesoprion*	75
* *dodecacanthus, Mesoprion*	102
Dodes	124
Dog snapper	93,108
Dolesan	74

	PAGE
Dorade à tache noire	81
Dorie-snapper	81
Dory snapper	81
★ *dubius, Chaetopterus*	153
Dumbwara	117
★ *duodecemilineate, Diacope*	107

E

Edion-san	75,78
Edion-si	54,80,88
Edui	160
Eenkol-snapper	106
★ *ehrenbergii, Lutianus*	76
ehrenbergii, Lutjanus	76
Ehu	27
★ *elegans, Mesoprion*	157
★ *elongatus, Mesoprion*	62
★ *elongatus, Sparopsis*	20
★ *emarginatus, Lobotes*	88
Emperor red snapper	116
Emperor snapper	117
endecacanthus, Lutjanus	77
★ *enneacanthus, Mesoprion*	123
★ *erythrina, Diacope*	115
★ *erythrognathus, Mesoprion*	99
erythropterus, Lutjanus	78
Estrella	109
★ *etaape, Mesoprion*	96
Etelis	24
★ *Etelis brevirostris*	147
Etelis carbunculus	26
Etelis coruscans	27
★ *Eteliscus marshi*	26
★ *Etelis evurus*	27
★ *Etelis filamentosus*	156
★ *Etelis nudimaxillaris*	156
Etelis oculatus	28
Etelis radiosus	29
★ *eutactus, Lutjanus*	74
★ *Evopli*	33
★ *evurus, Etelis*	27

F

★ *fasciatus, Bodianus*	56
Fiamasaika	81
Fiamasiaka	60,65,103
Fiambato	81
Fiamena	65,103
★ *filamentosus, Etelis*	156
filamentosus, Pristipomoides	147
filamentosus, Randallichthys	156
★ *filamentosus, Serranus*	147
Fimbo	21
Five-lined snapper	111
Flamenco	91
★ *flavipes, Diacope*	82
★ *flavipinnis, Mesoprion*	58
flavipinnis, Pristipomoides	149
★ *flaviroseus, Mesoprion*	66
★ *flavivultus, Aphareus*	18
freemani, Pristipomoides	150
Freshwater snapper	83
Fuatundu	115,117
Fuedai	119
fulgens, Lutjanus	79
★ *fulgens, Mesoprion*	79
fulviflamma, Lutjanus	80
★ *fulviflamma, Sciaena*	80
★ *fulvus, Holocentrus*	82
fulvus, Lutjanus	82
furcatus, Aphareus	18
★ *furcatus, Labrus*	18
★ *furvicaudatus, Lutjanus*	97
fuscescens, Lutjanus	83
★ *fuscescens, Mesoprion*	83
fuscus, Apsilus	23

G

★ *gaimardi, Mesoprion*	82
★ *garretti, Mesoprion*	58
Geelstert-iesang	137
Geelstreep-snapper	83
★ *gembra, Alphestes*	58
★ *Genyor*	33
★ *Genyoroge amabilis*	52
★ *Genyoroge bidens*	84
★ *Genyoroge grammica*	111
★ *Genyoroge macleayana*	78
★ *Genyoroge nigricauda*	82
★ *Genyoroge notata sexlineata*	111
★ *Genyoroge notata sublineata*	111
★ *Genyoroge regia*	116
★ *Genyoroge unicolor*	52
★ *gibba, Sciaena*	84
gibbus, Lutjanus	84
Gindai	155
Gingao	60
Gola	103
Goldbanded jobfish	152
Golden African snapper	79
Golden eye jobfish	149

	PAGE
Golden snapper	92
Goldflag jobfish	146
goldiei, Lutjanus	86
* *goldiei, Mesoprion*	86
Goma-fueda	60
gonzalesi, Paracaesio	133
Gorean snapper	87
goreensis, Lutjanus	87
* *goreensis, Mesoprion*	87
* *grammica, Genyoroge*	111
Green job-fish	21
Green jobfish	20-21
Grey snapper	88
Gringo	109
* *griseoides, Mesoprion*	58
griseus, Lutjanus	88
Guachinango	61
Guachinango del Golfo	69
Guasinuco	73
guilcheri, Lutjanus	89
Guinea snapper	77
* *guineensis, Lutjanus*	87
guntheri, Hoplopagrus	30
Guntol	21
Gurutsu	19
guttatus, Lutjanus	90
* *guttatus, Mesoprion*	90
Hussar	53
Hutihuti	97
* *Hypopl*	33

I

* *immaculata, Diacope*	82
* *immaculatus, Mesoprion*	97
Indian snapper	100
Indonesian snapper	63
inermis, Lutjanus	92
* *inermis, Mesoprion*	92
Irezumi-fuedai	160
Irriranna	97
Ishifuedai	19
Islawan	81
* *isodon, Mesoprion*	55
Itohiki-fuedai	161
Itten-fuedai	106

H

Ha'amea	65
Hachijô-akamutsu	27
Haha	54,80,88
Hamadai	28
Hamrah	65,103,115
Hana fuedai	146
Haputu	113
Haraki	85
Hime-fuedai	85
Himedai	153
Hobara	81,97
* *hober, Centropomus*	80
* *Holocentrus bengalensis*	61
* *Holocentrus boutton*	66
* *Holocentrus fulvus*	82
* *Holocentrus quinquelinearis*	111
* *Holocentrus quinquelineatus*	111
Hoplop	30
Hoplopagrus guntheri	30
* *hoteen, Mesoprion*	83
Huachinango	61,72,91,95, 108-109,123
Hublot	114
Humpback red snapper	84
Humphead snapper	115
Hunu ranna	100

J

Jania	97
Janja	62,77,81, 99-100,113-114, 124
* *janthinuropterus, Mesoprion*	97
* *janthinurus, Mesoprion*	84
Japanese snapper	132
Jaunet	67,124
Jocú	93
* *jocu, Anthias*	92
jocu, Lutjanus	92
John's snapper	94
* *johngarah, Lutianus*	58
* *johnii, Anthias*	94
johnii, Lutjanus	94
Jordan's snapper	95
jordani, Lutjanus	95
* *jordani, Neomaensis*	95

PAGE

K

Kaakap 21
* *kagoshima, Mesoprion* 82
Kakaka 83
Kalamiya 154
Kalaskasin 153
Kali kali 147
Kalikali 153
Kalumbang 60
Kamang 124
Kamang buhu 84
* *kanekonis, Aprion* 147
Kanu 128
kasmira, Lutjanus 96
* *kasmira, Sciaena* 96
Katambak 65
Kedesaulvengi 60
Keiser-snapper 117
Kelea 81,97
Keremlal 85
Késan 54,80,88
Késan-gba 75,78
Kesebii 63
Kesebij 83
Kèskès 78,88
Kifimbo 21
Kimadara-himedai 147
Kinme-himedai 150
Kinsen-fuedai 100
Kinsidini 54,75
Kisang 60
Kisuji-tarumi 76
Kleintand-jobvis 20
Konde sevalai 103
* *konekonis, Aprion* 20
Kotongl 65
Kpéna 54,80,88
Krong 19
Kula-kula 60
Kungu 65
Kuruvilla 113
kusakarii, Paracaesio 134
Kyûssen-fuedai 67

L

Labongan 63
* *Labrus furcatus* 18
* *labuan, Diacope* 64
Labungan 106,114
Lagan 160
Lala'i 85
Lane snapper 119
Langisi 154
Lapu-lapu 103
* *latifrons, Sparopsis* 20
Lavender jobfish 153
Lehi 20
lemniscatus, Lutjanus 97
* *lemniscatus, Serranus* 97
* *lepisurus, Sparus* 64
* *linea, Mesoprion* 56
* *lineata, Diacope* 84
* *lineolata, Diacope* 99
* *lioglossus, Lutjanus* 106
Lipocheilus 32
Lipocheilus carnolabrum 32
* *litura, Mesoprion* 92
* *Lobotes emarginatus* 88
Lodong 60
Lomia 154
* *longmani, Lutjanus* 78
* *Loxolu* 33
Luggambanda 81
Lunartail snapper 98
* *lunulata, Perca* 98
lunulatus, Lutjanus 98
* *Lutian* 33
* *Lutianus ehrenbergii* 76
* *Lutianus johngarah* 58
* *Lutianus luzonius* 66
* *Lutianus nishikawae* 113
* *Lutianus nukuhivae* 64
* *Lutianus salmonoides* 58
* *Lutianus tahitiensis* 84
Lutjan 33
Lutjan à bandes noires 118
Lutjan à lignes jaunes 100
Lutjan aimable 53
Lutjan fauve 83
Lutjan rouge 65
* *Lutjanus acutirostris* 56
Lutjanus adetii 52
Lutjanus agennes 53
* *Lutjanus altifrontalis* 78
Lutjanus ambiguus 54
Lutjanus analis 55
Lutjanus apodus 56
Lutjanus aratus 57
Lutjanus argentimaculatus 58
Lutjanus argentiventris 60
* *Lutjanus aubrieti* 119
Lutjanus bengalensis 61
Lutjanus biguttatus 62
Lutjanus bitaeniatus 63
* *Lutjanus blackfordii* 68
* *Lutjanus blochii* 99
Lutjanus bohar 64
Lutjanus boutton 66
* *Lutjanus brachypterus* 119
Lutjanus buccanella 67
Lutjanus campechanus 68
* *Lutjanus campechianus* 68
Lutjanus carponotatus 69
* *Lutjanus castelnaui* 52
* *Lutjanus coatesi* 64
Lutjanus coeruleolineatus 70
Lutjanus colorado 71
* *Lutjanus comoriensis* 84

	PAGE
★ *Lutjanus cubera*	72
Lutjanus cyanopterus	72
★ *Lutjanus cynodon*	72
Lutjanus decussatus	73
Lutjanus dentatus	74
Lutjanus dodecacanthoides	75
Lutjanus ehrenbergii	76
Lutjanus endecacanthus	77
Lutjanus erythropterus	78
★ *Lutjanus eutactus*	74
Lutjanus fulgens	79
Lutjanus fulviflamma	80
Lutjanus fulvus	82
★ *Lutjanus furvicaudatus*	97
Lutjanus fuscescens	83
Lutjanus gibbus	84
Lutjanus goldiei	86
Lutjanus goreensis	87
Lutjanus griseus	88
Lutjanus guilcheri	89
★ *Lutjanus guineensis*	87
Lutjanus guttatus	90
Lutjanus inermis	92
Lutjanus jocu	92
Lutjanus johnii	94
Lutjanus jordani	95
Lutjanus kasmira	96
Lutjanus lemniscatus	97
★ *Lutjanus lioglossus*	106
★ *Lutjanus longmani*	78
Lutjanus lunulatus	98
lutjanus, Lutjanus	99
Lutjanus lutjanus	99
Lutjanus madras	100
Lutjanus mahogoni	101
Lutjanus malabaricus	102
★ *Lutjanus maltzani*	79
★ *Lutjanus marginatoides*	82
Lutjanus maxweberi	103
★ *Lutjanus melanurus*	129
Lutjanus mizenkoi	105
★ *Lutjanus modestus*	53
Lutjanus monostigma	106
Lutjanus notatus	107
Lutjanus novemfasciatus	108
★ *Lutjanus octolineatus*	107
★ *Lutjanus oligolepis*	76
★ *Lutjanus orientalis*	113
★ *Lutjanus palmeri*	103
★ *Lutjanus paravitta*	52
Lutjanus peru	109
★ *Lutjanus prieto*	108
Lutjanus pupureus	110
Lutjanus quinquelineatus	111
Lutjanus rivulatus	112
Lutjanus russelli	113
Lutjanus sanguineus	115
Lutjanus sebae	116
Lutjanus semicinctus	117
★ *Lutjanus stearnsi*	88
Lutjanus stellatus	118
Lutjanus synagris	119
Lutjanus timorensis	121
★ *Lutjanus torridus*	124
★ *Lutjanus unimaculatus*	80
Lutjanus viridis	122
Lutjanus vitta	123
Lutjanus vivanus	124
★ *luzonius, Lutianus*	66

M

	PAGE
★ *macleayana, Genyoroge*	78
Macolor	125
★ *macolor, Diacope*	127
Macolor macularis	126
Macolor niger	127
★ *Macolor typus*	127
Macotod	124
★ *macrophthalmus, Centropristes*	151
macrophthalmus, Pristipomoides	151
macularis, Macolor	126
Madam Simèr	80
Madame tombée	117
Madras	97
madras, Lutjanus	100
★ *madras, Mesoprion*	100
Maestro	57
Magu magu	83
Mahogany snapper	101
mahogoni, Lutjanus	101
★ *mahogoni, Mesprion*	101
Mala'i-pa'epa'e	122
Malabar blood snapper	102
malabaricus, Lutjanus	102
★ *malabaricus, Sparus*	102
Malaponte	160-161
★ *maltzani, Lutjanus*	79
Mame Simér	80
Managat	98
Manambulao	153
Manchego	120
Mangagat	60,98
Mangrove jack	60
Mangrove red snapper	58
Manila	70
Manilan-on	70
Manul	140
Marangsi	97,112
Maransing	63,100
★ *marginata, Diacope*	82
★ *marginatoides, Lutjanus*	82
★ *marginipinnis, Mesoprion*	82
★ *marshi, Eteliscus*	26
Matala'oa	128
Matangal	67,81,117,154
★ *maus, Mesoprion*	82
maxweberi, Lutjanus	103
Maya-maya	63,65,70,85, 94,100,103,106, 114,117,124,128

	PAGE
	160
Mbawaa	97
Mbeureugane	24
★ *megalophthalmus, Neomaenis*	119
★ *megalops, Rhomboplitoides*	99
★ *melanospilos, Mesoprion*	66
★ *melanura, Diacope*	84
★ *melanurus, Lutjanus*	129
Mena	60
Mero mero	65
★ *Mesopr*	33
★ *Mesoprion ambiguus*	54
★ *Mesoprion analis*	55
★ *Mesoprion annularis*	78
★ *Mesoprion aratus*	57
★ *Mesoprion argenteus*	82
★ *Mesoprion argentiventris*	60
★ *Mesoprion arnillo*	22
★ *Mesoprion aureovittatus*	80
★ *Mesoprion auro-lineatus*	80
★ *Mesoprion aurovittatus*	129
★ *Mesoprion bleekeri*	62
★ *Mesoprion buccanella*	67
★ *Mesoprion campechanus*	68
★ *Mesoprion caroui*	99
★ *Mesoprion carponotatus*	69
★ *Mesoprion caudalis*	98
★ *Mesoprion caudanotatus*	67
★ *Mesoprion chirtah*	78
★ *Mesoprion chrysotaenia*	69
★ *Mesoprion cyanopterus*	72
★ *Mesoprion cynodon*	56
★ *Mesoprion decussatus*	73
★ *Mesoprion dentatus*	74
★ *Mesoprion dodecacanthoides*	75
★ *Mesoprion dodecacanthus*	102
★ *Mesoprion elegans*	157
★ *Mesoprion elongatus*	62
★ *Mesoprion enneacanthus*	123
★ *Mesoprion erythrognathus*	99
★ *Mesoprion etaape*	96
★ *Mesoprion flavipinnis*	58
★ *Mesoprion flaviroseus*	66
★ *Mesoprion fulgens*	79
★ *Mesoprion fuscescens*	83
★ *Mesoprion gaimardi*	82
★ *Mesoprion garretti*	58
★ *Mesoprion goldiei*	86
★ *Mesoprion goreensis*	87
★ *Mesoprion griseoides*	58
★ *Mesoprion guttatus*	90
★ *Mesoprion hoteen*	83
★ *Mesoprion immaculatus*	97
★ *Mesoprion inermis*	92
★ *Mesoprion isodon*	55
★ *Mesoprion janthinuropterus*	97
★ *Mesoprion janthinurus*	84
★ *Mesoprion kagoshima*	82
★ *Mesoprion linea*	56
★ *Mesoprion litura*	92
★ *Mesoprion madras*	100
★ *Mesoprion marginipinnis*	82
★ *Mesoprion maus*	82
★ *Mesoprion melanospilos*	66
★ *Mesoprion microchir*	20
★ *Mesoprion mitchelli*	139
★ *Mesoprion monostigma*	106
★ *Mesoprion multidens*	152
★ *Mesoprion myriaster*	112
★ *Mesoprion naborer*	69
★ *Mesoprion nematophorus*	160
★ *Mesoprion obscurus*	58
★ *Mesoprion olivaceus*	58
★ *Mesoprion ophuysenii*	123
★ *Mesoprion pacificus*	108
★ *Mesoprion pargus*	72
★ *Mesoprion parvidens*	112
★ *Mesoprion phaiotaeniatus*	123
★ *Mesoprion pomacanthus*	61
★ *Mesoprion profundus*	124
★ *Mesoprion quadripunctatus*	112
★ *Mesoprion rangus*	64
★ *Mesoprion rosaceus*	55
★ *Mesoprion roseigaster*	58
★ *Mesoprion rubellus*	78
★ *Mesoprion rubens*	64
★ *Mesoprion russelli*	113
★ *Mesoprion sexfaciatus*	58
★ *Mesoprion sobra*	55
★ *Mesoprion taeniops*	58
★ *Mesoprion terubuan*	80
★ *Mesoprion therapon*	73
★ *Mesoprion uninotatus*	119
★ *Mesoprion vivanus*	124
★ *Mesoprion xanthopterygius*	99
★ *Mesprion mahogoni*	101
★ *Mesprion ojanco*	101
★ *Mesprion ricardi*	101
Metngui	20
Mexican barred snapper	30
★ *microchir, Mesoprion*	20
★ *microdon, Aprion*	147
★ *microlepis, Chaetopterus*	147
Midnight snapper	126
Minami-fuedai	94
★ *mitchelli, Mesoprion*	139
mizenkoi, Lutjanus	105
★ *modestus, Lutjanus*	53
Moluccan snapper	66
monostigma, Lutjanus	106
★ *monostigma, Mesoprion*	106
Moses perch	114
Mu	65
Mu-a'a	65
Mu-mafalaugutu	113
Mu-mea	65
Mu-taiva	60
Mullet snapper	57
★ *multidens, Mesoprion*	152
multidens, Pristipomoides	152
Mutton snapper	55
★ *myriaster, Mesoprion*	112

PAGE

N

* *naborer, Mesoprion* 69
Nadaratarumi 128
Nagan 100
Nagasaki fuedai 152
Naisara 81
Naisarah 81,94,97,100, 114
Nami-fuedai 113
Ndiagatoum 88
Negra 68
* *nematophorus, Mesoprion* 160
nematophorus, Symphorus 160
* *Neomae* 33
* *Neomaenis megalophthalmus* 119
* *Neomaenis peru* 109
* *Neomaensis jordani* 95
* *Neomes* 33
Ngkalalk 128
niger, Macolor 127
* *nigra, Sciaena* 127
* *nigricauda, Genyoroge* 82
Nikini 78,88
Nise kurohoshi-feudai 81
* *nishikawae, Lutianus* 113
Northern red snapper 68
* *notatus, Diacope* 107
notatus, Lutjanus 107
* *nouleny, Serranus* 99
novemfasciatus, Lutjanus 108
* *nudimaxillaris, Etelis* 156
* *nukuhivae, Lutianus* 64
Numba 117

O

Oblique banded snapper 155
Oblique-banded snapper 155
* *obscurus, Mesoprion* 58
* *octolineata, Diacope* 61,96
* *octolineatus, Lutjanus* 107
* *octovittata, Diacope* 61
oculatus, Etelis 28
* *oculatus, Serranus* 28
Ocyurus 129
Ocyurus chrysurus 129
* *Ocyurus rijgersmoei* 129
Oguchi-ishichibiki 20
Ohime 148
Ojanco 102
* *ojanco, Mesprion* 101
Oki-fuedai 83
Okuchi-hamadai 30
* *oligolepis, Lutjanus* 76

PAGE

* *olivaceus, Mesoprion* 58
Onaga 28
One-spot snapper 106
Onespot snapper 106
Opakapaka 148,150
* *ophuysenii, Mesoprion* 123
Oreille noire 68
* *orientalis, Lutjanus* 113
Ornate jobfish 145

P

Pacific red snapper 109
* *pacificus, Mesoprion* 108
Padalla 83
Paddle-tail 85
Pagre dentchien 57
Pale snapper 29
* *palmeri, Lutjanus* 103
Palu malau 27
Palu-ena'ena 148
Palu-gutusiliva 20
Palu-i'usama 147
Palu-loa 28
Palu-mutu 136
Palu-sega 152
Palu-sina 150
Palu-tuasama 137
Palu-tuauli 134
Palu-tusimoana 146
Palualoalo 19
Panchito 145
Panchito abanderado 146
Panchito adornado 145
Panchito de bandas doradas 152
Panchito de ojo dorado 149
Panchito dentón 154
Panchito escamudo 138
Panchito hebra 147
Panchito lavanda 153
Panchito menudo 150
Panchito ojón 151
Panchito rayado 155
Panchito voraz 144
Panchote azul 135
Panchote cacao 136
Panchote japonés 132
Panchote rabo amarillo 137
Panchote sillevo 134
Panchote vanuatú 133
Panza prieta 108
Papuan black bass 87
Papuan black snapper 86
Para galla 103
Paracaes 130
Paracaesio caeruleus 132
Paracaesio gonzalesi 133

	PAGE
Paracaesio kusakarii	134
* *Paracaesio pedleyi*	137
Paracaesio sordidus	135
Paracaesio stonei	136
Paracaesio xanthurus	137
Parai	106
Paraj	85
Paramao	91
Parapris	138
Parapristipomoides aquamimaxillaris	138
* *paravitta, Lutjanus*	52
Pardo	91
Pargo	31,58,61,72, 83,91,95,108, 123
Pargo abanderado	69
Pargo ajedrezado	73
Pargo amarillo	56-57,60-61
Pargo ambiguo	54
Pargo azul dorado	122
Pargo barbirubia	92
Pargo bermellón	19
Pargo biajaiba	119
Pargo bitilla	123
Pargo blanco	61
Pargo blanco y negro	127
Pargo boquidulce	18
Pargo caballo	73
Pargo cabezón	115
Pargo cachucho	28
Pargo carmesí	78
Pargo cebado	56
Pargo cebal	56
Pargo chino	92
Pargo chivato	91
Pargo cinteado	117
Pargo coconaco	30
Pargo coconato	31
Pargo coliamarillo	61
Pargo colorado	56,58,61,69, 72,91,95,108, 110-111,158
Pargo colorado africano	53
Pargo común	57
Pargo con lunar	91
Pargo con mancha	91
Pargo cotorro	57
Pargo criollo	55-56
Pargo cubera	72
Pargo cunaro	157
Pargo de agua dulce	83
Pargo de aleta negra	91
Pargo de altura	91
Pargo de banda	62
Pargo de Bengala	61
Pargo de cinco lineas	111
Pargo de dos manchas	64
Pargo de Gorea	87
Pargo de Guinea	77
Pargo de Indonesia	63
Pargo de jilguero	58
Pargo de la mancha	91
Pargo de lo alto	124-125
Pargo de Madras	99
Pargo de manglar	58,61
Pargo de Molucas	66
Pargo de Papua	86
Pargo de Randall	156
Pargo de rayas amarillas	97
Pargo de rayas azules	96
Pargo de Samoa	105
Pargo de seda	91,95
Pargo de Timor	121
Pargo del Golfo	68
Pargo dentón	61
Pargo diablo	160
Pargo dientón	31,61
Pargo docenario	107
Pargo dorado africano	79
Pargo eglefino	106
Pargo enano	103
Pargo estrellado	118
Pargo estriado	70
Pargo flamenco	91
Pargo gringo	109
Pargo guanapo	120
Pargo imperial	116
Pargo jaspeado	94
Pargo jilguero	58,108
Pargo jocú	93
Pargo jorobado	84
Pargo lunarejo	72,90-91
Pargo madraseño	100
Pargo malabárico	102
Pargo manchado	76
Pargo manglero	89
Pargo maorí	112
Pargo marrón africano	74
Pargo medianoche	126
Pargo moreno	108
Pargo mulatillo	61
Pargo mulato	22-23,56
Pargo negro	108
Pargo nochero	52
Pargo ojo de buey	113
Pargo ojón	101
Pargo pálido	29
Pargo perro	93
Pargo prieto	88-89,91,93, 108
Pargo rabo amarillo	89
Pargo rabo negro	82
Pargo raboluna	98
Pargo raicero	31,57-58
Pargo rayado	31,58,123
Pargo real	111
Pargo rojo	61,71-72,95, 109,111
Pargo roquero	31
Pargo rosquero	31,61
Pargo rubí	26-27
Pargo seda	95
Pargo sesí	67
Pargo solrayo	75
Pargo tijera	24
Pargo tintero	81
Pargo trompudo	32
Pargo velero	158

	PAGE
Pargo verde	20
Pargo viviano	92
Pargueta	72,91
Parguito	63
* *pargus, Mesoprion*	72
* *Parkia*	33
Parog dentón	89
Parqueta	91
Paru	19
Paru 'i'ihi	27
* *parvidens, Mesoprion*	112
Parvo	61,91,108
Parvo rojo	95
Paswan	94
* *pedleyi, Paracaesio*	137
* *Perca apoda*	56
* *Perca lunulata*	98
Perch écarlate	103
Perche à raies bleues	112
Perche blanche et noire	128
peru, Lutjanus	109
* *peru, Neomaenis*	109
* *phaiotaeniatus, Mesoprion*	123
Pinjalo	139
Pinjalo cenceño	140
Pinjalo fluet	140
Pinjalo s	140
* *pinjalo, Caesio*	139
pinjalo, Pinjalo	139
Pinjalo pinjalo	139
Pink opakapaka	148
Pla kapong	81,97,100,114, 124,154
Pla kapong dang	74,83,94,103, 106,117
* *Platyiniu*	141
* *Platynius amoenus*	145
Polahan	103
* *pomacanthus, Mesoprion*	61
Pouatte	117
* *prieto, Lutjanus*	108
Pristipom	141
* *Pristipomoides andersoni*	144
Pristipomoides aquilonaris	144
Pristipomoides argyrogrammicus	145
Pristipomoides auricilla	146
Pristipomoides filamentosus	147
Pristipomoides flavipinnis	149
Pristipomoides freemani	150
Pristipomoides macrophthalmus	151
Pristipomoides multidens	152
Pristipomoides sieboldii	153
* *Pristipomoides squamimaxillaris*	138
Pristipomoides typus	154
Pristipomoides zonatus	155
* *profundus, Mesoprion*	124
* *Promblys*	125
Puaki	85,106
Pulakau	79
Pulariam	65
pupureus, Lutjanus	110
Pygmy snapper	103

Q

	PAGE
* *quadriguttata, Diacope*	64
* *quadripunctatus, Mesoprion*	112
Queen snapper	28
Queue en pagaic	85
* *quinquelinearis, Holocentrus*	111
* *quinquelineatus, Holocentrus*	111
quinquelineatus, Lutjanus	111

R

	PAGE
Rabirrubia	130
Rabirubia	92,129
* *rabirubia, Anthias*	129
radiosus, Etelis	29
* *Raizer*	33
Randall's snapper	156
Randalli	156
Randallichthys filamentosus	156
* *rangus, Mesoprion*	64
Rayado	120
Red bass	65
Red emperor	117
* *regia, Genyoroge*	116
* *revulina, Diacope*	112
Reyall	83
* *Rhombo*	33,157
Rhomboplites aurorubens	157
* *Rhomboplitoides megalops*	99
* *ricardi, Mesprion*	101
* *rijgersmoei, Ocyurus*	129
River snapper	60
Rivier-snapper	60
* *rivulata, Diacope*	112
rivulatus, Lutjanus	112
Robyn-snapper	28
Rojo	72
Rokusen-fuedai	112
* *rosaceus, Mesoprion*	55
* *rosea, Diacope*	84
* *roseigaster, Mesoprion*	58
* *roseus, Aphareus*	147
Rosy jobfish	148
Rouge	111,120
Rouget	60

	PAGE
Rouget de nuit	53
★ *rubellus, Mesoprion*	78
★ *rubens, Mesoprion*	64
Rubia	92
Rubio	158
Ruby snapper	26-28
★ *rufolineata, Diacope*	66
Russel se snapper	114
Russell's snapper	113-114
russelli, Lutjanus	113
★ *russelli, Mesoprion*	113
Rusty jobfish	19
rutilans, Aphareus	19
Rymas	65

S

	PAGE
Saas	97
★ *sacrestinus, Caranxomorus*	18
Saddle-back snapper	134
Saddle-tailed sea-perch	79
Saging-saging	100
Sagisi	20
Sagision	135
Sailfin snapper	158
Salmonete de lo alto	29
★ *salmonoides, Lutianus*	58
Saltador	95
Saltona	95
Samoan snapper	105
Sampak bakal	161
★ *sanguinea, Diacope*	115
sanguineus, Lutjanus	115
Sarde	102
Sarde dent chien	93
Sarde grise	89
Sarde queue jaune	130
Sarde rouge	111
Sare-sare	19
Sarrah	154
Savane	97
Savane-ulasama	67
Scalemouth jobfish	138
Scarlet sea-perch	103
Schoolmaster snapper	56
★ *Sciaena argentata*	58
★ *Sciaena argentimaculatus*	58
★ *Sciaena bohar*	64
★ *Sciaena fulviflamma*	80
★ *Sciaena gibba*	84
★ *Sciaena kasmira*	96
★ *Sciaena nigra*	127
Scude	120
★ *sebae, Diacope*	116
sebae, Lutjanus	116
Sebus	27,103
Sedakatakasago	141
semicinctus, Lutjanus	117
★ *semiluna, Sparus*	129
Sen-nendai	117
★ *Serranus argyrogrammicus*	145
★ *Serranus biguttatus*	62
★ *Serranus filamentosus*	147
★ *Serranus lemniscatus*	97
★ *Serranus nouleny*	99
★ *Serranus oculatus*	28
★ *Serranus vitta*	123
★ *Serranus zonatus*	155
Sesí	68
★ *sexfaciatus, Mesoprion*	58
★ *sexlineata, Genyoroge notata*	111
Sharptooth jobfish	154
Shima-aodai	134
Shimachi biki	155
★ *siamensis, Diacope*	116
★ *sieboldii, Chaetopterus*	153
sieboldii, Pristipomoides	153
Siksik	106
Silay	81
Silk snapper	124
★ *sinal, Diacope*	112
Skeefband-snapper	155
Slender pinjalo	140
Slender wenchman	150
Small tooth jobfish	20
Small toothed jobfish	18
Small-toothed jobfish	20
★ *sobra, Mesoprion*	55
Sorbe	56
sordidus, Paracaesio	135
Sorora	100
Southern fusilier	137
Southern red snapper	110
Spanish flag	70
Spanish flag snapper	69
★ *Sparopsis elongatus*	20
★ *Sparopsis latifrons*	20
★ *Sparus caxis*	56
★ *Sparus chrysurus*	129
★ *sparus, Diacope*	152
★ *Sparus lepisurus*	64
★ *Sparus malabaricus*	102
★ *Sparus semiluna*	129
★ *Sparus synagris*	119
★ *Sparus tetracanthus*	88
★ *Sparus vermicularis*	119
Speckled snapper	113
Spikkel-snapper	113
★ *spilura, Diacope*	111
spilurus, Symphorichthys	158
★ *spilurus, Symphorus*	158
Spotted rose snapper	90
Spotted-scale sea-perch	94
★ *squamimaxillaris, Pristipomoides*	138
Star snapper	118
★ *stearnsi, Lutjanus*	88
stellatus, Lutjanus	118
stonei, Paracaesio	136
★ *striata, Diacope*	84
★ *striatus, Bodianus*	56
Stripey	70

	PAGE
* *sublineata, Genyoroge notata*	111
Sunbeam snapper	75
* *superbus, Diacope*	58
Swartkol-snapper	77
Swartnooi	128
Sympho	158
Symphorichthys spilurus	158
Symphorus	160
Symphorus nematophorus	160
* *Symphorus spilurus*	158
synagris, Lutjanus	119
* *synagris, Sparus*	119

T

Ta'ape	97
Tadlungan	60
* *taeniops, Mesoprion*	58
Tagafi	65
Tagau	65
Tagpian	161
Tahakari	19
* *tahitiensis, Lutianus*	84
Taiva	106
Taivaiva	106
Talotoon	153
Talungan	60
Tamala	83
Tambangao	74
Tang's snapper	32
* *Tangia carnolabrum*	32
Tatatata	65
Te awai	21
Te balusenga	19
Te baotaburimai	118
Te bave	83
Te baveata	97
Te boingo	65
Te bukinrin	20
Te ikakoa	19
Te ikanibong	85
Te ingo	65
Te savane	97
Te taaea	85
Te taiva	106
Te tangau	83
Te tinaemia	106
Te utu	21
Tecomate	31
Telingan	106
Tembo	77,81
Tembo-uzi	97
Tembouzi	100
Tero	85,106
* *terubuan, Mesoprion*	80
* *tetracanthus, Sparus*	88
Thambalaya	60
* *therapon, Mesoprion*	73
* *thompsoni, Aphareus*	19
Ti-yeux	158
* *tiea, Diacope*	84
Timor snapper	121
* *timorensis, Diacope*	121
timorensis, Lutjanus	121
Tingarog	83
Tingayog	65
To'au	83
Tohare	97
* *torridus, Lutjanus*	124
* *Tropidini*	141
Tsivaravara	65
Tuhara	85
Tumaro	158
* *tumidus, Vegetichthys*	137
Turang	155
Tweekol-snapper	65
Twin spot snapper	65
Two-spot banded snapper	62
Two-spot red snapper	64
* *typus, Macolor*	127
typus, Pristipomoides	154

U

Udel	21
Uku	21
Ula-ula	148
Ulaula	27,141
* *ulaula, Bowersia*	153
Ulu	155
Umeiro	137
Unga	60
* *unicolor, Genyoroge*	52
* *unimaculatus, Lutjanus*	80
* *uninotatus, Mesoprion*	119
Utu	21,153

V

* *vaigiensis, Diacope*	82
Vanuatu snapper	133
Vara-vara	65
Varavara	60
Varavarana	81
* *Vegetich*	130
* *Vegetichthys caeruleus*	132
* *Vegetichthys tumidus*	137
Vermelho	111

	PAGE
* *vermicularis, Sparus*	119
Vermilion snapper	157
Villajaiba	120
* *violescens, Bowersia*	147
virescens, Aprion	20
* *viridis, Diacope*	122
viridis, Lutjanus	122
* *vitianus, Diacope*	66
vitta, Lutjanus	123
* *vitta, Serranus*	123
Vivaneau à bande blanche	62
Vivaneau à bande brune	123
Vivaneau à bandes noires	117
Vivaneau à cinq bandes	111
Vivaneau à nageoires jaunes	150
Vivaneau à raies bleues	96,107
Vivaneau à raies jaunes	97
Vivaneau à taches jaunes	147
Vivaneau africain rouge	53
Vivaneau amarante	71
Vivaneau ambigu	54
Vivaneau barbe blonde	92
Vivaneau blanc	148
Vivaneau bleu et doré	122
Vivaneau bourgeois	116
Vivaneau brun (d'Afrique)	74
Vivaneau campêche	68
Vivaneau charbonnier	108
Vivaneau chien	93
Vivaneau chien rouge	64
Vivaneau cramoisi	78
Vivaneau cubéra	72
Vivaneau d'eau douce	83
Vivaneau damier	73
Vivaneau de Goré	87
Vivaneau de Guinée	77
Vivaneau de l'Indonesie	63
Vivaneau de nuit	52
Vivaneau de Papua	86
Vivaneau de Randall	156
Vivaneau de Sâmoa	105
Vivaneau de Timor	121
Vivaneau dentchien	56
Vivaneau des mangroves	58
Vivaneau des Moluques	66
Vivaneau diable	160
Vivaneau doré	79
Vivaneau drapeau	69
Vivaneau du Bengale	61
Vivaneau eglefin	106
Vivaneau encrier	76
Vivaneau étoilé	118
Vivaneau fourche (d'Afrique)	24
Vivaneau garance	109
Vivaneau gazou	119
Vivaneau gibelot	81
Vivaneau gros yeux	99
Vivaneau grosse-écaille	152
Vivaneau huachinango	95
Vivaneau hublot	113
Vivaneau jaune	60
Vivaneau job	20
Vivaneau la flamme	28
Vivaneau laflamme	27
Vivaneau madras	100
Vivaneau malabar	102
Vivaneau maori	112
Vivaneau mexicain	30
Vivaneau minuit	126
Vivaneau nain	103
Vivaneau noir	22
Vivaneau oreille noire	67
Vivaneau pagaie	84
Vivaneau pâle	29
Vivaneau plate	127
Vivaneau queue jaune	89,129
Vivaneau queue lune	98
Vivaneau queue noire	82
Vivaneau radis	57
Vivaneau rose	90
Vivaneau rouge	27,110
Vivaneau rouillé	19
Vivaneau royal	28
Vivaneau rubis	26
Vivaneau sarde grise	88
Vivaneau soie	124
Vivaneau soleil	75
Vivaneau sorbe	55
Vivaneau strié	70
Vivaneau têtu	115
Vivaneau ti-yeux	157
Vivaneau tidents	18
Vivaneau verrue	32
Vivaneau voilier	158
Vivaneau voyeur	101
Vivaneau ziebelo	94
* *vivanet, Bodianus*	88
Vivanette bleu	135
Vivanette cacao	136
Vivanette japonaise	132
Vivanette queue jaune	137
Vivanette sellée	134
Vivanette vanuatu	133
vivanus, Lutjanus	124
* *vivanus, Mesoprion*	124
Voraz	145,151

W

Wali	54
Warale	75
Wenchman	144
Woli	75

PAGE PAGE

X

* *xanthopterygius, Mesoprion* 99
* *xanthopus, Diacope* 82
* *xanthurus, Caesio* 137
xanthurus, Paracaesio 137

Y

Yâkh 54
Yakh 75
Yanbaru-shima-aodai 136
Yellow snapper 60
Yellow-banded sea perch 53
Yellow-banded snapper 52
Yellow-margined sea-perch 83
Yellow-striped snapper 83
Yellowfin red snapper 89
Yellowstreaked snapper 97
Yellowtail blue snapper 137
Yellowtail fusilier 137
Yellowtail snapper 129
Yogore-aodai 135
Yoko-fuedai 103
Yokosuji-fuedai 124
Yosuji-fueda 97

Z

Zazamanango 117
Ziebelo 77
Zoho 60
zonatus, Pristipomoides 155
* *zonatus, Serranus* 155

7. COLOUR PLATES

The colour plates are arranged by major geographical marine areas, in order to facilitate their use by field workers. The colour paintings were carried out under the supervision of the author by the following three illustrators:

1. R. Swainston, Perth, Australia
2. M. Thompson, Perth, Australia
3. P. Lastrico, FAO, Rome.

The numbers in brackets following the species names indicate the respective illustrator.

WESTERN ATLANTIC

Fishing Areas 31, 41

PLATE I

1 Apsilus dentatus (1)
1a Apsilus dentatus (juvenile) (1)
2 Etelis oculatus (1)
3 Lutjanus ambiguus (1)
4 Lutjanus analis (1)

PLATE II

5 Lutjanus apodus (1)
6 Lutjanus buccanella (1)
7 Lutjanus campechanus (1)
8 Lutjanus cyanopterus (1)

PLATE III

9 Lutjanus griseus (grey variety) (3)
9a Lutjanus griseus (red variety) (1)
10 Lutjanus jocu (1)
11 Lutjanus mahogoni (1)

PLATE IV

12 Lutjanus purpureus (1)
13 Lutjanus synagris (shallow-water variety) (1)
13a Lutjanus synagris (deep-water variety) (1)
14 Lutjanus vivanus (1)

PLATE V

15 Ocyurus chrysurus (1)
16 Pristipomoides aquilonaris (1)
17 Pristipomoides freemani (1)
18 Pristipomoides macrophthalmus (1)
19 Rhomboplites aurorubens (1)

EASTERN ATLANTIC

Fishing Areas 34, 47

PLATE VI

20 Apsilus fuscus (1)
21 Lutjanus agennes (1)
22 Lutjanus dentatus (1)
23 Lutjanus endecacanthus (1)
24 Lutjanus fulgens (1)

PLATE VII

25 Lutjanus goreensis (1)

EASTERN PACIFIC

Fishing Areas 77, 87

PLATE VII

26 Hoplopagrus guntheri (1)
27 Lutjanus aratus (shallow-water variety) (1)
27a Lutjanus aratus (deep-water variety) (1)

PLATE VIII

28 Lutjanus argentiventris (1)
29 Lutjanus colorado (1)
30 Lutjanus guttatus (1)
31 Lutjanus inermis (1)

PLATE IX

32 Lutjanus jordani (1)
33 Lutjanus novemfasciatus (1)
34 Lutjanus peru (1)
35 Lutjanus viridis (1)

INDO-WEST PACIFIC

Fishing Areas 51, 57, 61, 71, 77, 81

PLATE X

36 Aphareus furcatus (2)
37 Aphareus rutilans (1)
38 Aprion virescens (1)
39 Etelis carbunculus (2)
40 Etelis coruscans (1)

PLATE XI

41 Etelis radiosus (1)
42 Lipocheilus carnolabrum (2)
43 Lutjanus adetii (1)
44 Lutjanus argentimaculatus (deep-water) (1)
44a Lutjanus argentimaculatus (juvenile) (1)
44b Lutjanus argentimaculatus (subadult - inshore) (1)

PLATE XII

45 Lutjanus bengalensis (2)
46 Lutjanus biguttatus (2)
47 Lutjanus bitaeniatus (1)
47a Lutjanus bitaeniatus (juvenile) (1)
48 Lutjanus bohar (2)

PLATE XIII

49 Lutjanus boutton (1)
50 Lutjanus carponotatus (1)
51 Lutjanus coeruleolineatus (2)
52 Lutjanus decussatus (2)

PLATE XIV

53 Lutjanus dodecacanthoides (1)
54 Lutjanus ehrenbergii (2)
55 Lutjanus erythropterus (1)
55a Lutjanus erythropterus (juvenile) (1)
56 Lutjanus fulviflamma (1)

PLATE XV

57 Lutjanus fulvus (2)
58 Lutjanus fuscescens (1)
58a Lutjanus fuscescens (juvenile) (1)
59 Lutjanus gibbus (1)
59a Lutjanus gibbus (juvenile) (1)

PLATE XVI

60 Lutjanus goldiei (1)
60a Lutjanus goldiei (barred variety) (1)
60b Lutjanus goldiei (black variety) (1)
61 Lutjanus guilcheri (2)

PLATE XVII

62 Lutjanus johnii (1)
63 Lutjanus kasmira (2)
64 Lutjanus lemniscatus (1)
64a Lutjanus lemniscatus (juvenile) (1)
65 Lutjanus lunulatus (1)

PLATE XVIII

66 Lutjanus lutjanus (1)
67 Lutjanus madras (2)
68 Lutjanus malabaricus (1)
68a Lutjanus malabaricus (juvenile) (1)
69 Lutjanus maxweberi (juvenile) (1)

PLATE XIX

70 Lutjanus mizenkoi (1)
71 Lutjanus monostigma (2)
72 Lutjanus notatus (= L. duodecemlineatus) (2)
73 Lutjanus quinquelineatus (2)

PLATE XX

74 Lutjanus rivulatus (2)
74a Lutjanus rivulatus (juvenile) (1)
75 Lutjanus russelli (Indian Ocean) (1)
75a Lutjanus russelli (Pacific) (1)
75b Lutjanus russelli (juvenile S.W. Pacific) (1)
75c Lutjanus russelli (juvenile-N.W. Pacific) (1)

PLATE XXI

76 Lutjanus sanguineus (2)
77 Lutjanus sebae (1)
77a Lutjanus sebae (juvenile) (1)
77b Lutjanus sebae (subadult) (1)
78 Lutjanus semicinctus (1)

PLATE XXII

79 Lutjanus stellatus (1)
80 Lutjanus timorensis (1)
80a Lutjanus timorensis (juvenile) (1)
81 Lutjanus vitta (1)
81a Lutjanus vitta (juvenile) (1)

PLATE XXIII

82 Macolor macularis (3)
82a Macolor macularis (juvenile) (3)
83 Macolor niger (1)
83a Macolor niger (juvenile) (1)
84 Paracaesio caeruleus (1)
85 Paracaesio gonzalesi (1)

PLATE XXIV

86 Paracaesio kusakarii (1)
87 Paracaesio sordidus (1)
88 Paracaesio stonei (1)
89 Paracaesio xanthurus (1)

PLATE XXV

90 Parapristipomoides squamimaxillaris (1)
91 Pinjalo pinjalo (3)
92 Pinjalo sp. (3)
93 Pristipomoides argyrogrammicus (1)

PLATE XXVI

94 Pristipomoides auricilla (1)
95 Pristipomoides filamentosus (1)
96 Pristipomoides flavipinnis (1)
97 Pristipomoides multidens (2)

PLATE XXVII

98 Pristipomoides sieboldii (2)
99 Pristipomoides typus
100 Pristipomoides zonatus (2)
101 Randallichthys filamentosus (1)

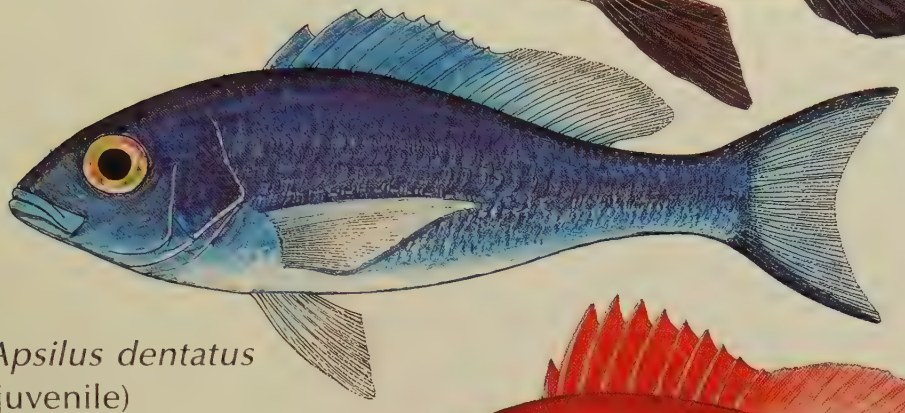
PLATE XXVIII

102 Symphorichthys spilurus (1)
102a Symphorichthys spilurus (juvenile) (1)
103 Symphorus nematophorus (2)
103a Symphorus nematophorus (juvenile) (2)

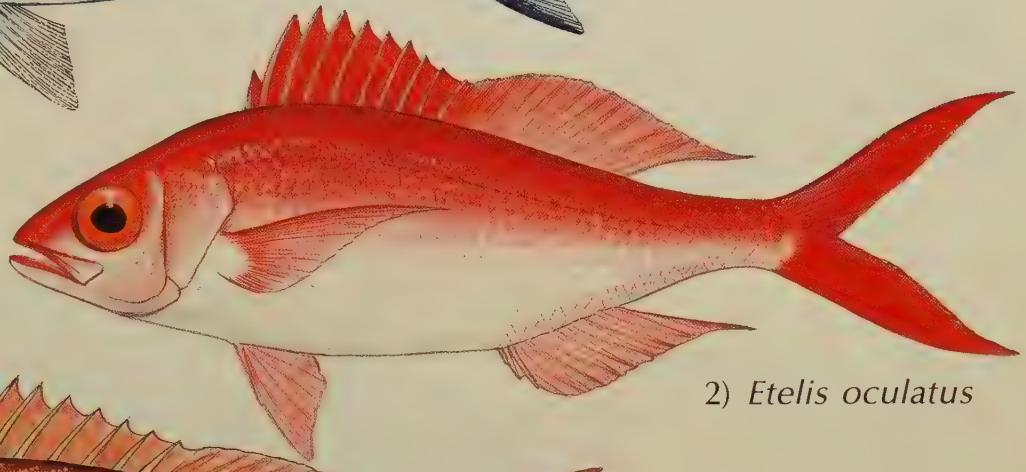
PLATE I

Western Atlantic - Fishing Areas 31, 41

1) *Apsilus dentatus*

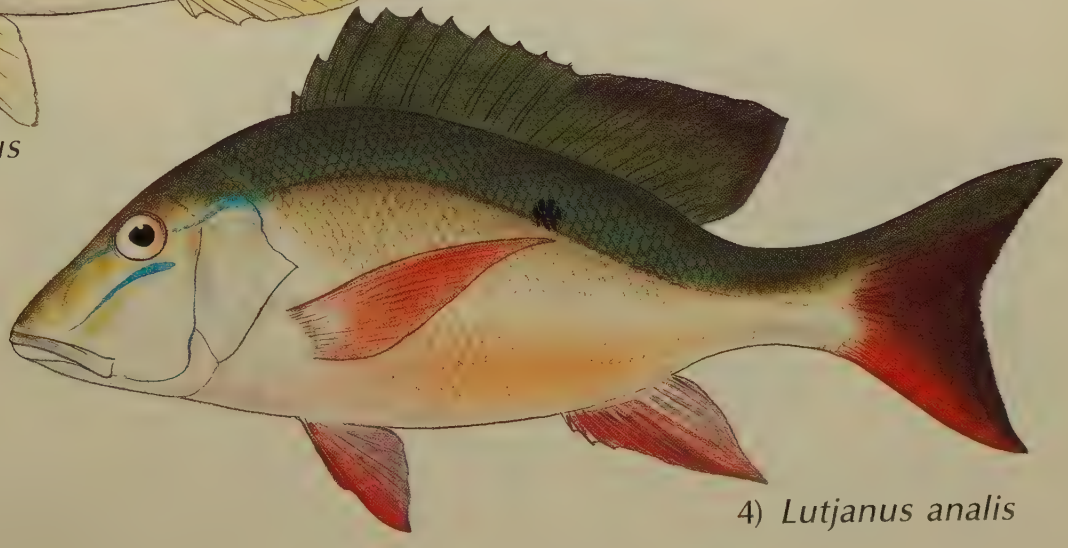


1a) *Apsilus dentatus*
(juvenile)



2) *Etelis oculatus*

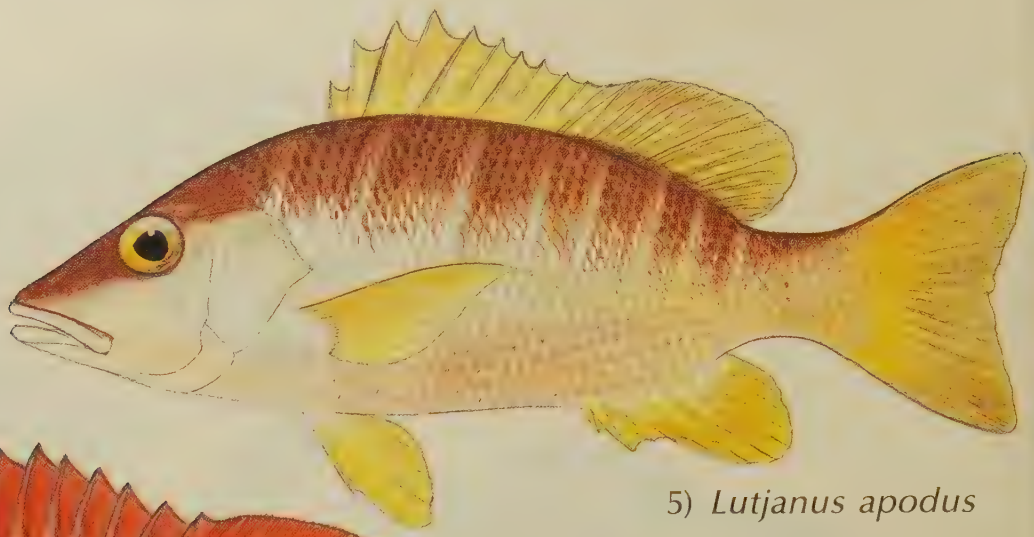
3) *Lutjanus ambiguus*



4) *Lutjanus analis*

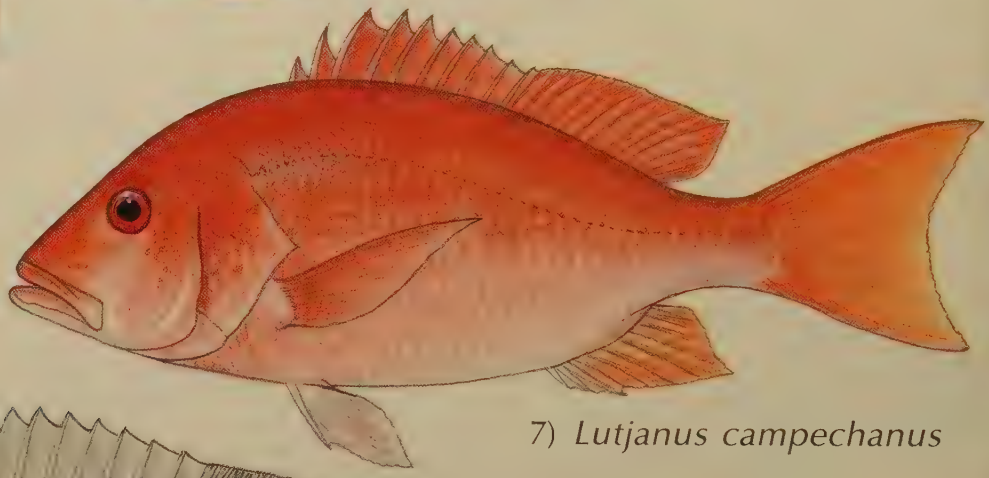
PLATE II

Western Atlantic - Fishing Areas 31, 41

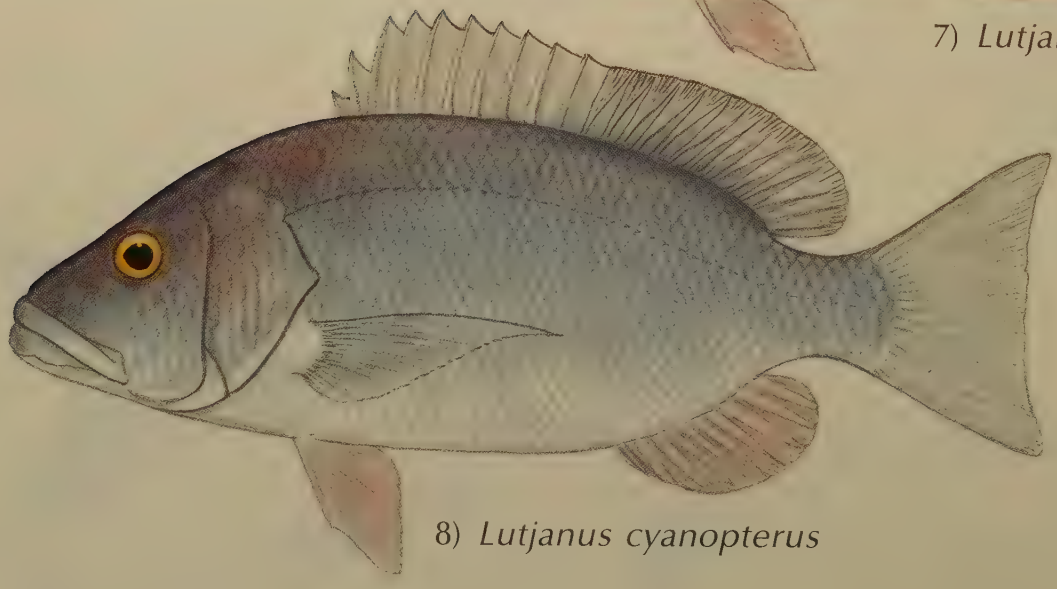


5) *Lutjanus apodus*

6) *Lutjanus buccanella*



7) *Lutjanus campechanus*

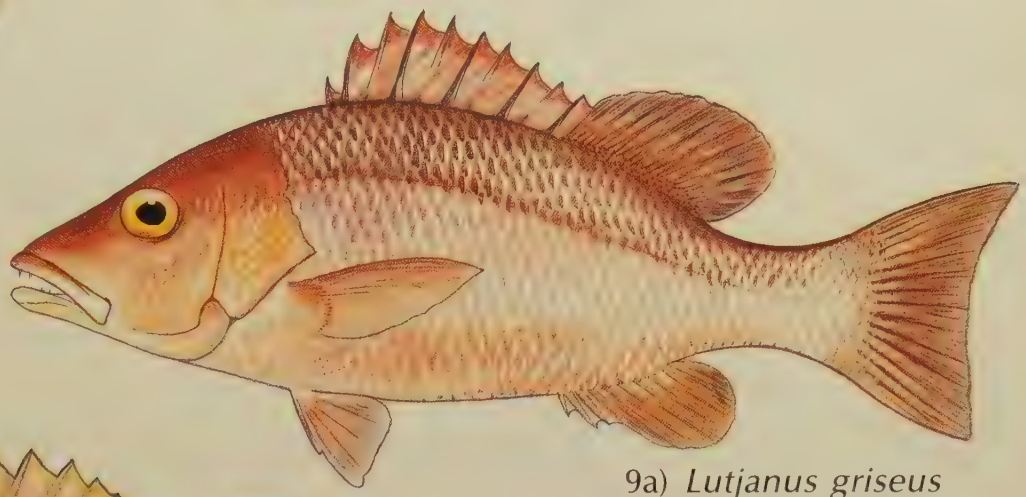


8) *Lutjanus cyanopterus*

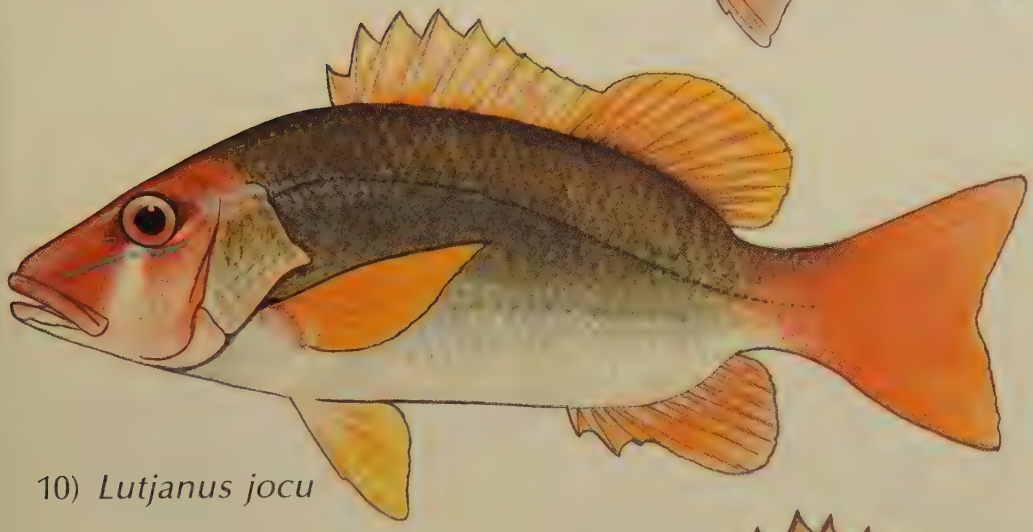
PLATE III

Western Atlantic - Fishing Areas 31, 41

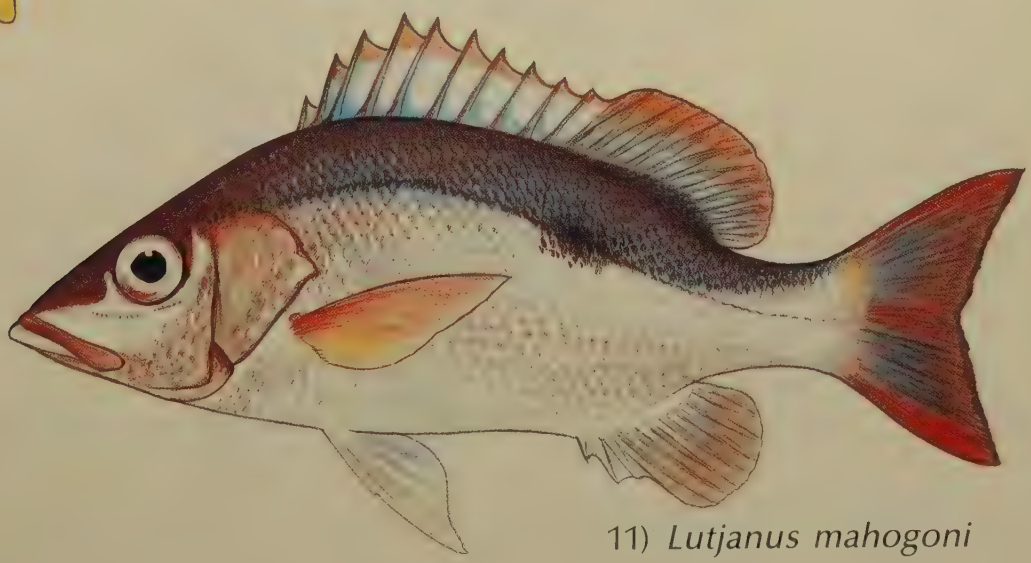
9) *Lutjanus griseus*
(grey variety)



9a) *Lutjanus griseus*
(red variety)



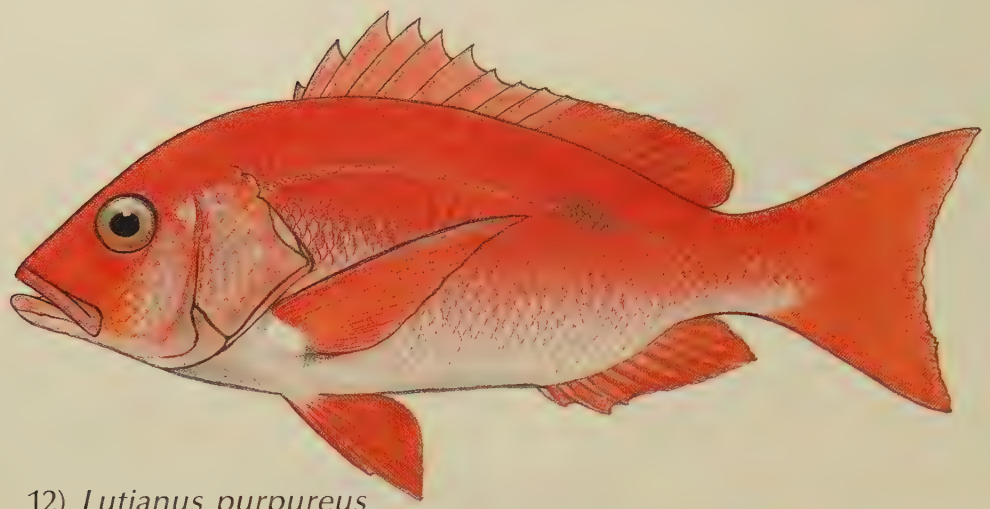
10) *Lutjanus jocu*



11) *Lutjanus mahogoni*

PLATE IV

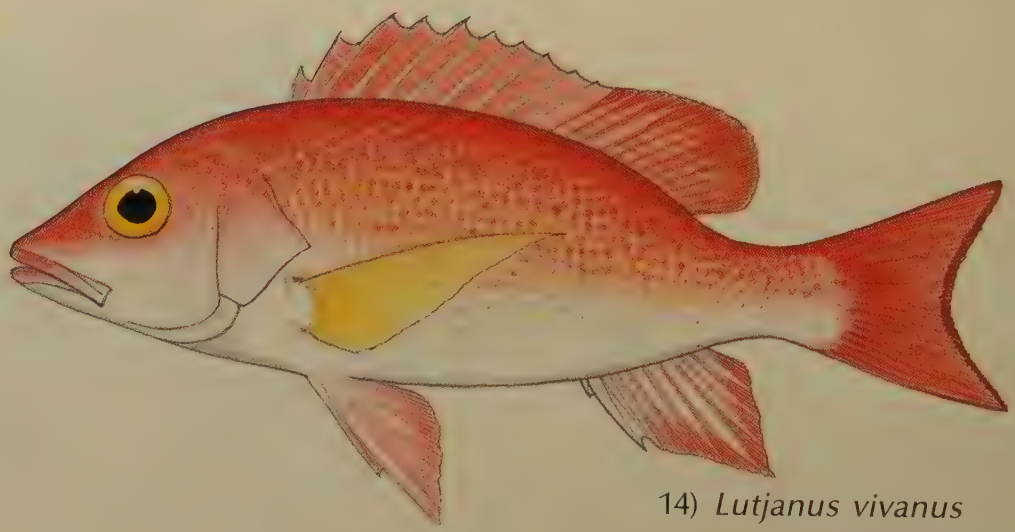
Western Atlantic - Fishing Areas 31,41



12) *Lutjanus purpureus*

13) *Lutjanus synagris*
(shallow-water variety)

13a) *Lutjanus synagris*
(deep-water variety)

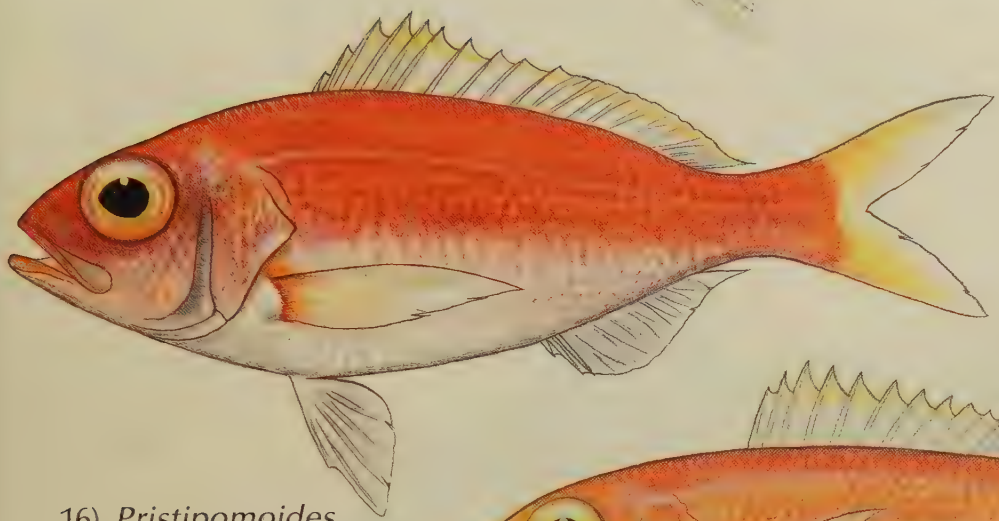


14) *Lutjanus vivanus*

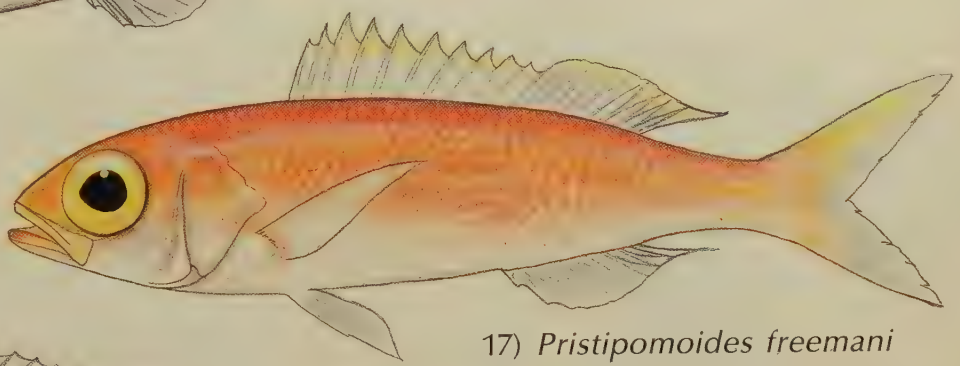
PLATE V

Western Atlantic - Fishing Areas 31, 41

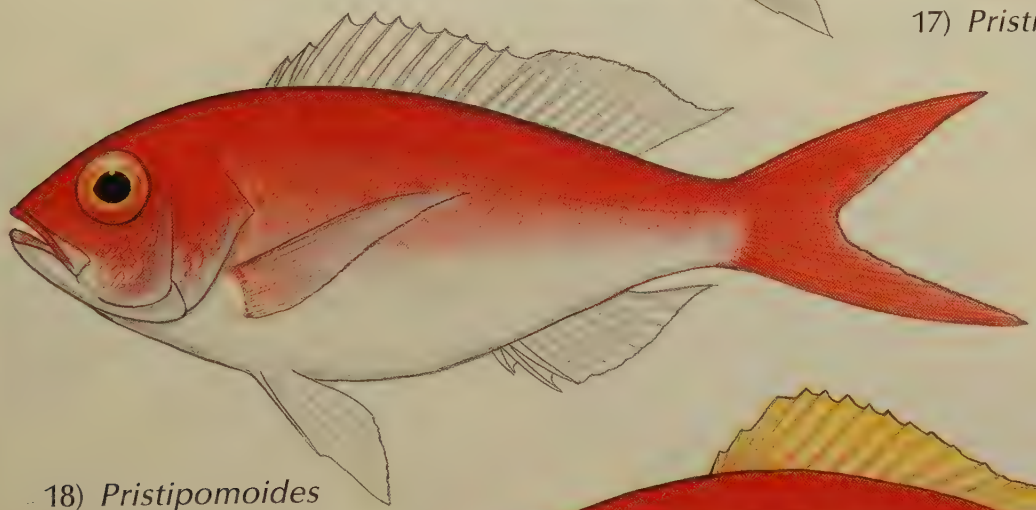
15) *Ocyurus chrysurus*



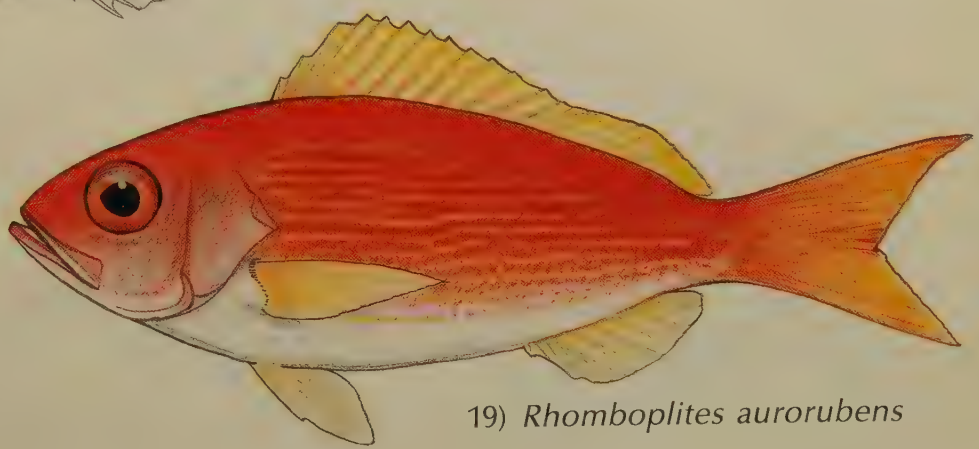
16) *Pristipomoides aquilonaris*



17) *Pristipomoides freemani*



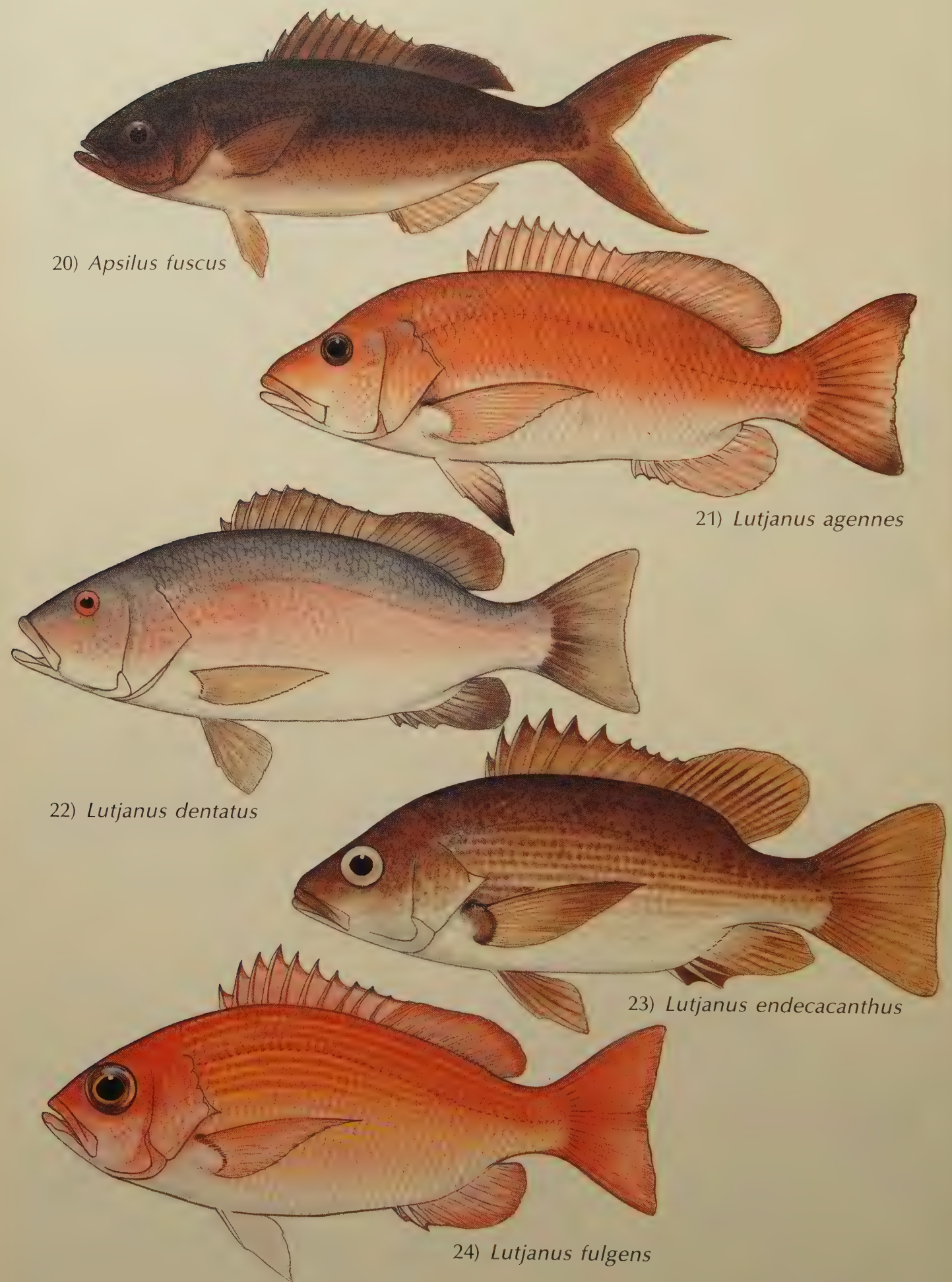
18) *Pristipomoides macrophthalmus*



19) *Rhomboplites aurorubens*

PLATE VI

Eastern Atlantic - Fishing Areas 34, 47



20) *Apsilus fuscus*

21) *Lutjanus agennes*

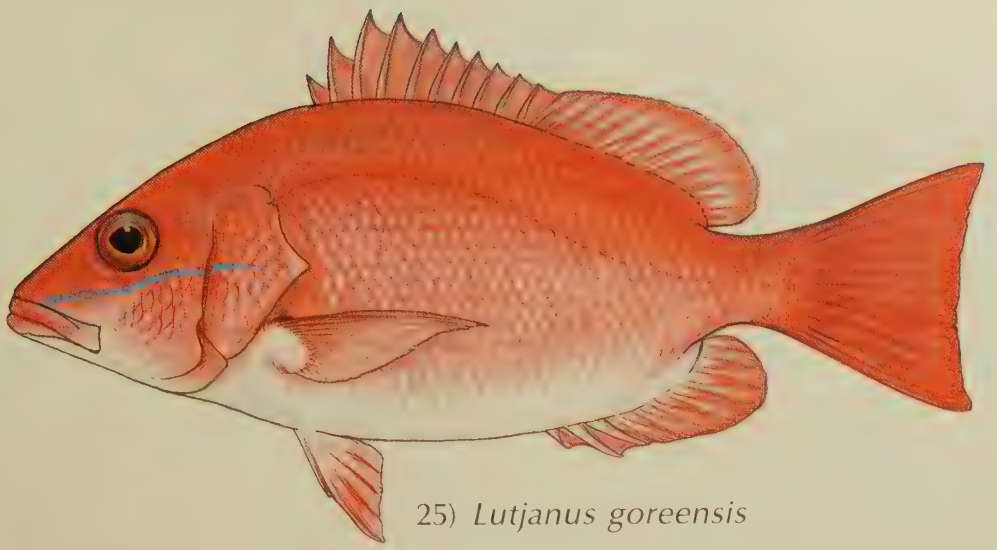
22) *Lutjanus dentatus*

23) *Lutjanus endecacanthus*

24) *Lutjanus fulgens*

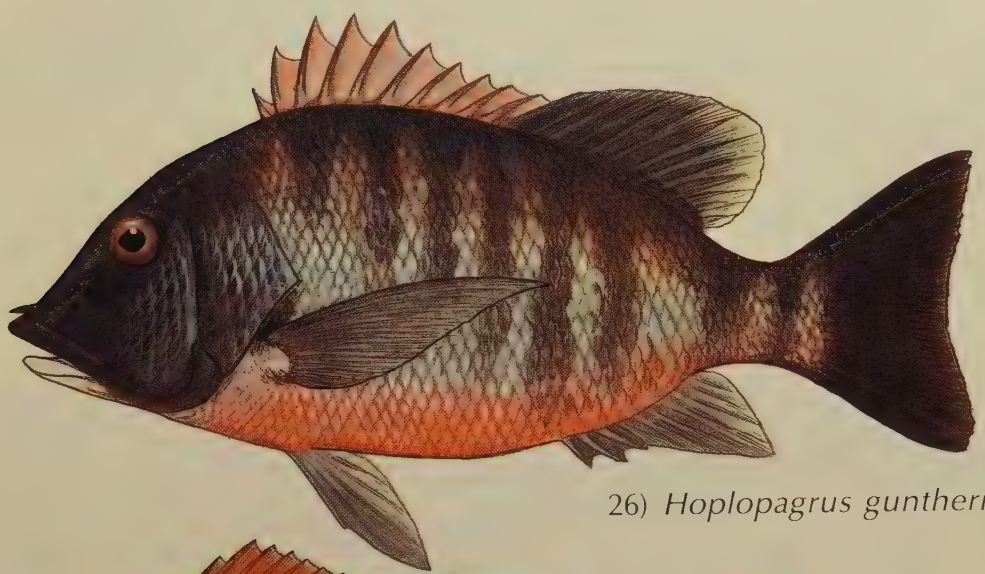
PLATE VII

Eastern Atlantic - Fishing Areas 34, 47



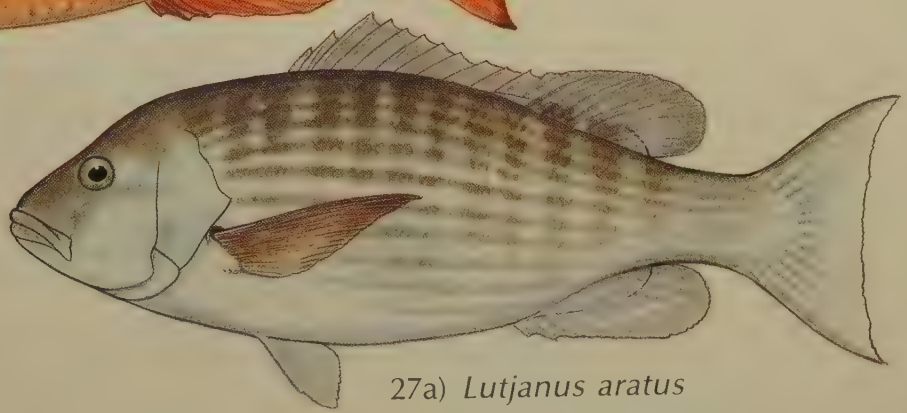
25) *Lutjanus goreensis*

Eastern Pacific - Fishing Areas 77, 87



26) *Hoplopagrus guntheri*

27) *Lutjanus aratus*
(shallow-water variety)

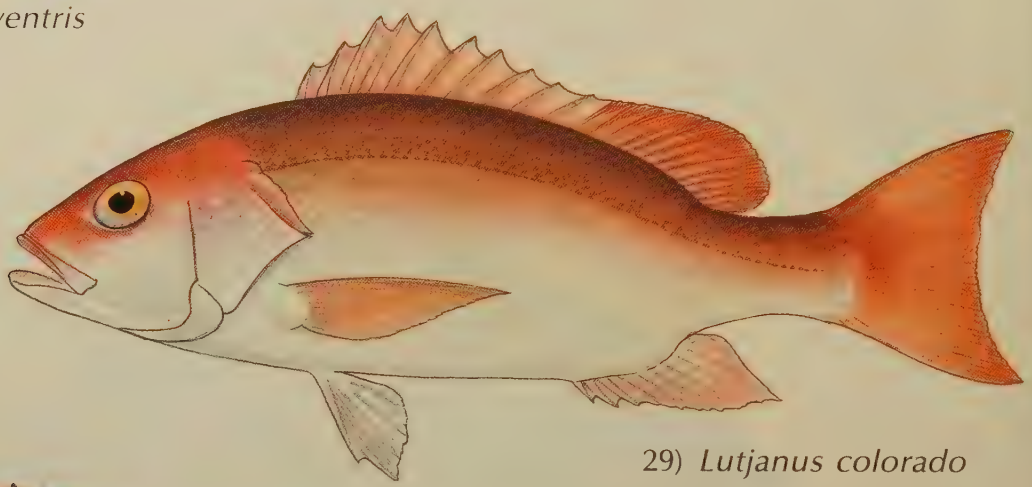


27a) *Lutjanus aratus*
(deep-water variety)

PLATE VIII

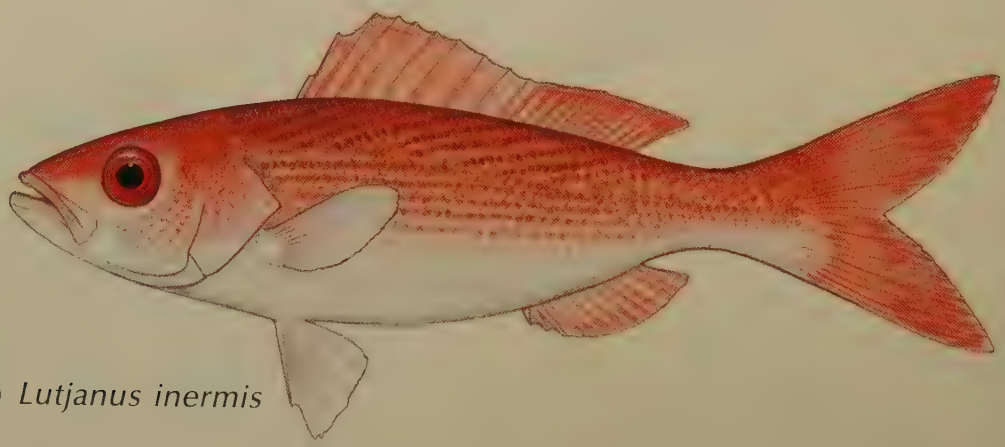
Eastern Pacific - Fishing Areas 77, 87

28) *Lutjanus argentiventris*



29) *Lutjanus colorado*

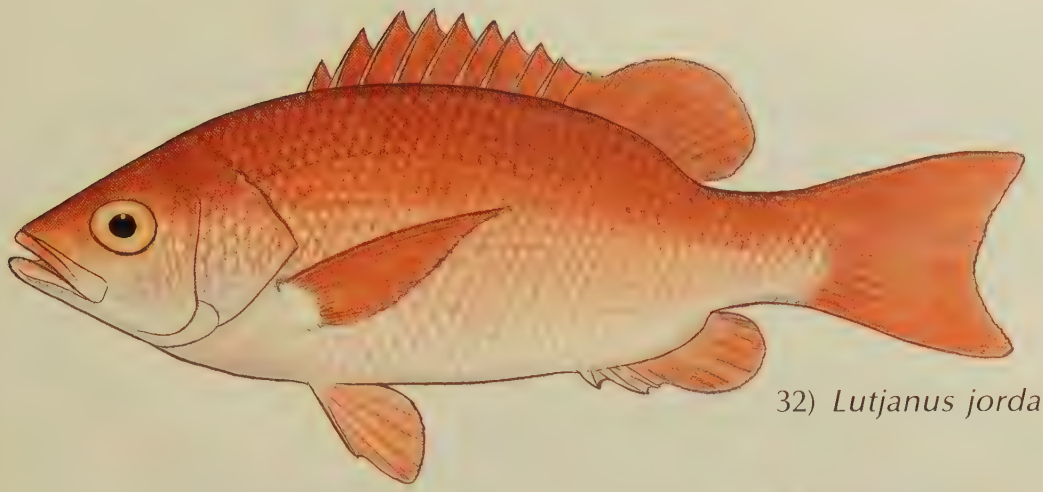
30) *Lutjanus guttatus*



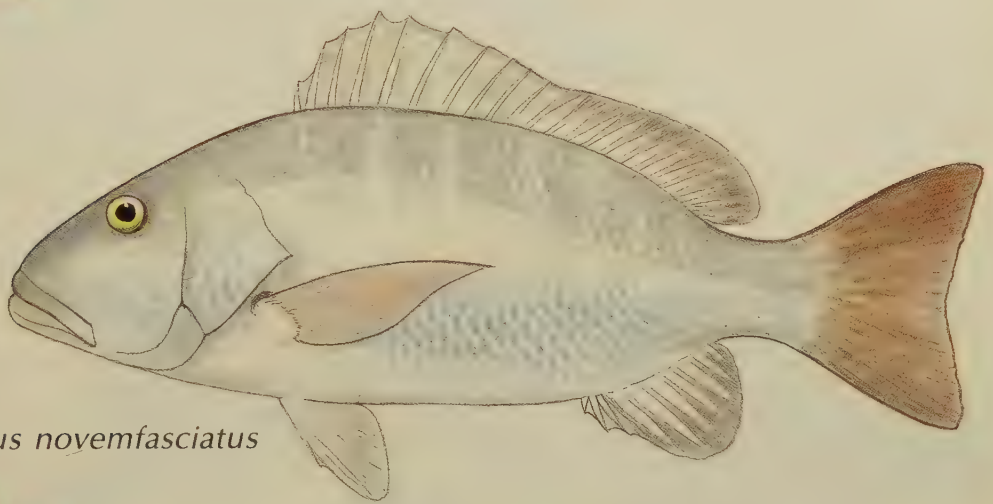
31) *Lutjanus inermis*

PLATE IX

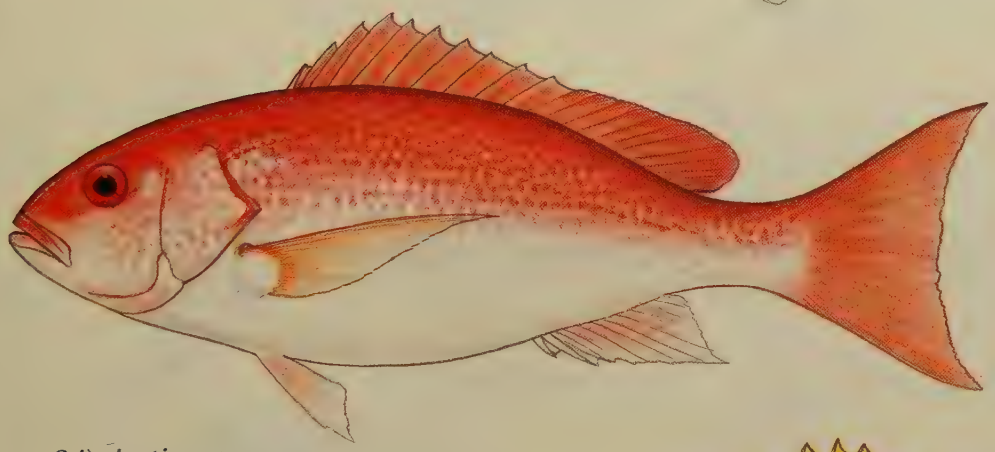
Eastern Pacific - Fishing Areas 77, 87



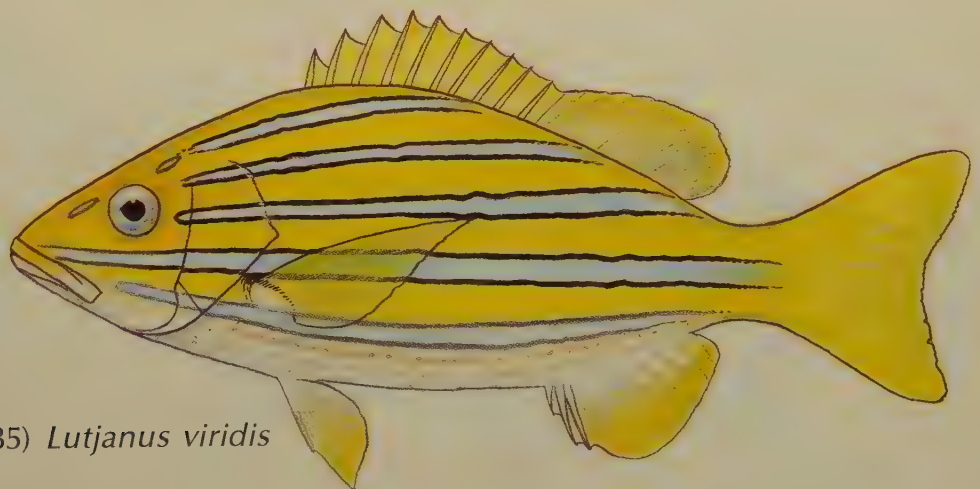
32) *Lutjanus jordani*



33) *Lutjanus novemfasciatus*



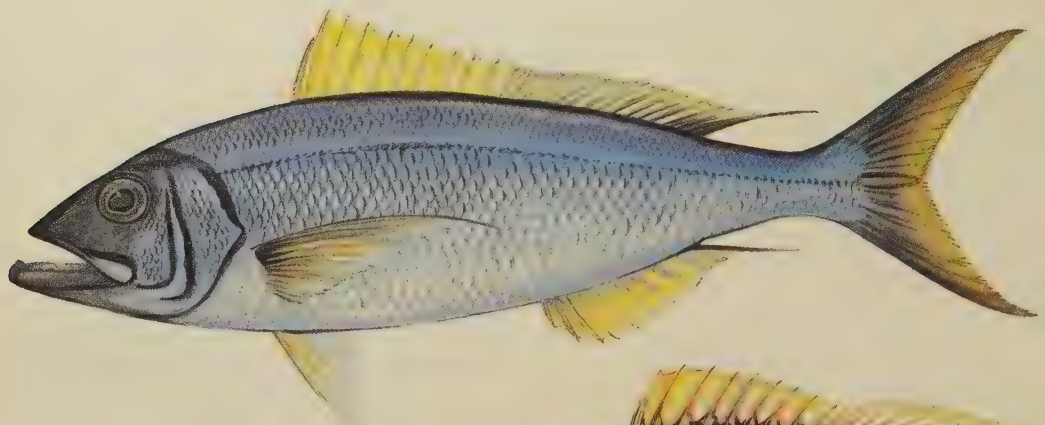
34) *Lutjanus peru*



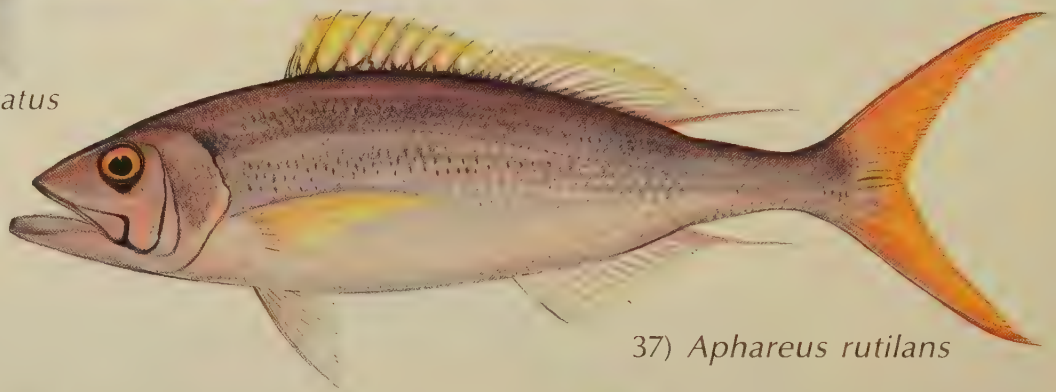
35) *Lutjanus viridis*

PLATE X

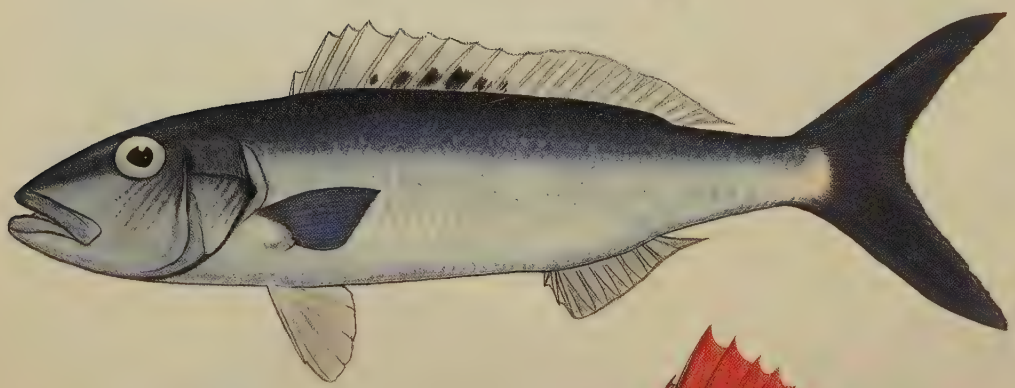
Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81



36) *Aphareus furcatus*



37) *Aphareus rutilans*



38) *Aprion virescens*

39) *Etelis carbunculus*

40) *Etelis coruscans*

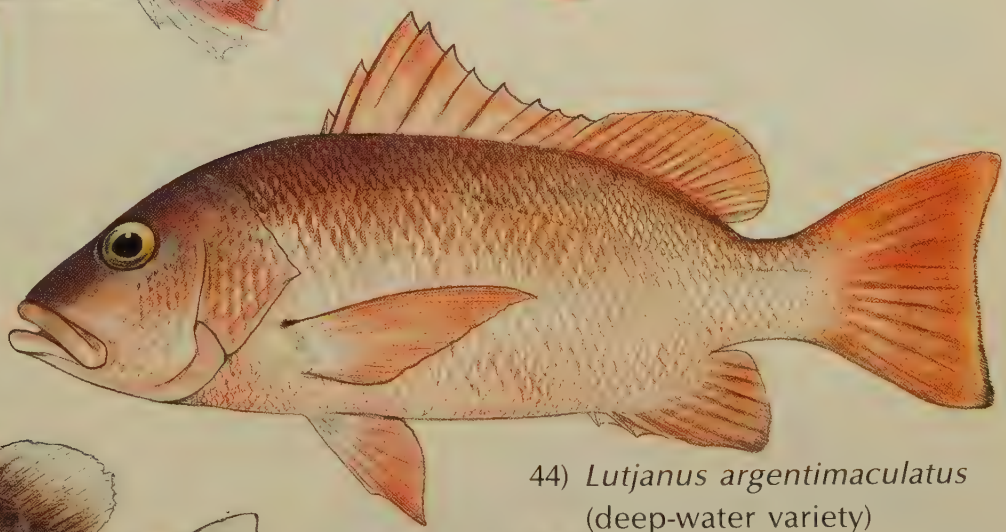
PLATE XI

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

41) *Etelis radiosus*

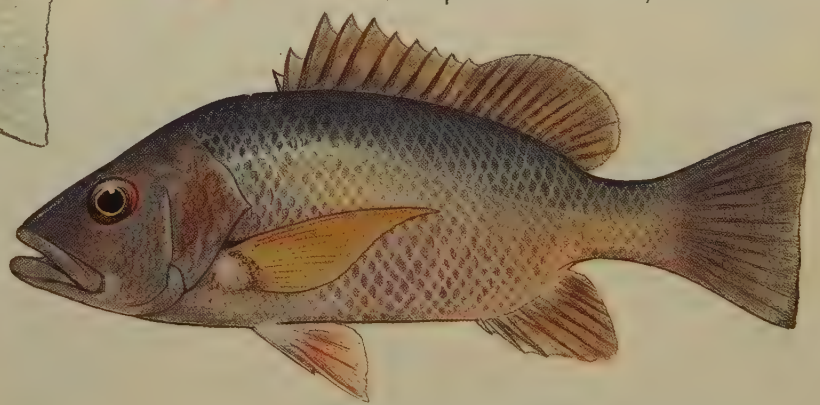
42) *Lipocheilus carnolabrum*

43) *Lutjanus adetii*



44) *Lutjanus argentimaculatus*
(deep-water variety)

44a) *Lutjanus argentimaculatus*
(juvenile)



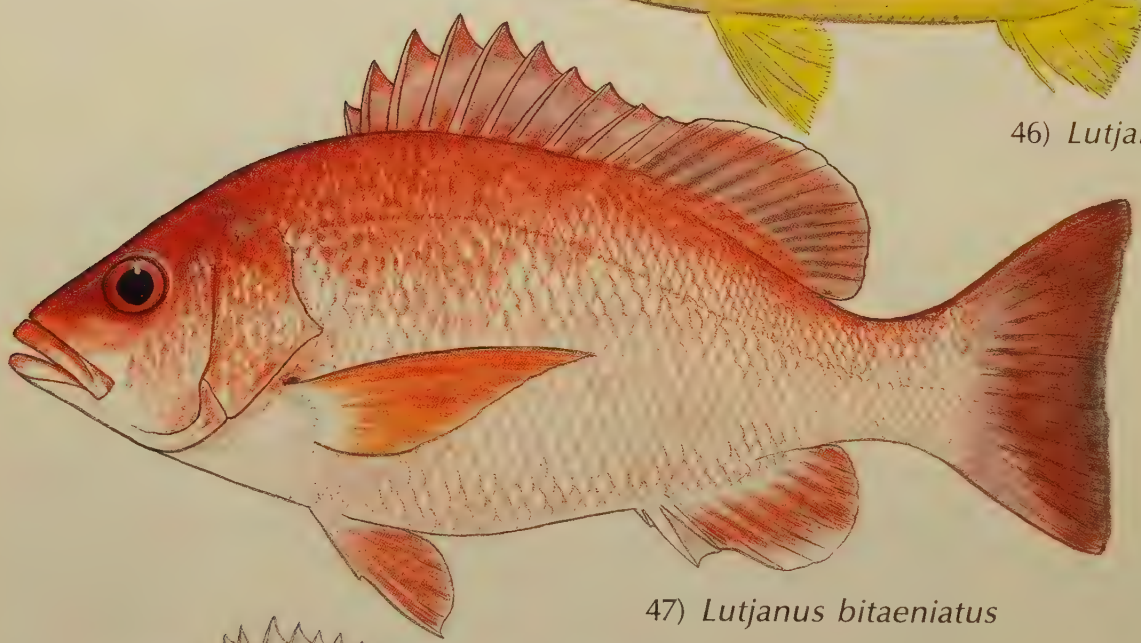
44b) *Lutjanus argentimaculatus*
(subadult - inshore)

PLATE XII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

45) *Lutjanus bengalensis*

46) *Lutjanus biguttatus*



47) *Lutjanus bitaeniatus*

47a) *Lutjanus bitaeniatus*
(juvenile)

48) *Lutjanus bohar*

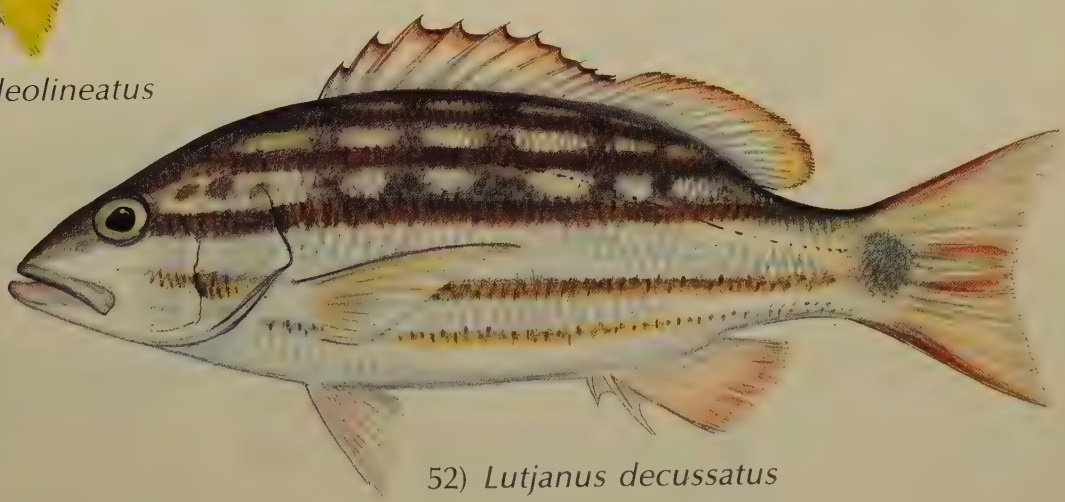
PLATE XIII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

49) *Lutjanus boutton*

50) *Lutjanus carponotatus*

51) *Lutjanus coeruleolineatus*



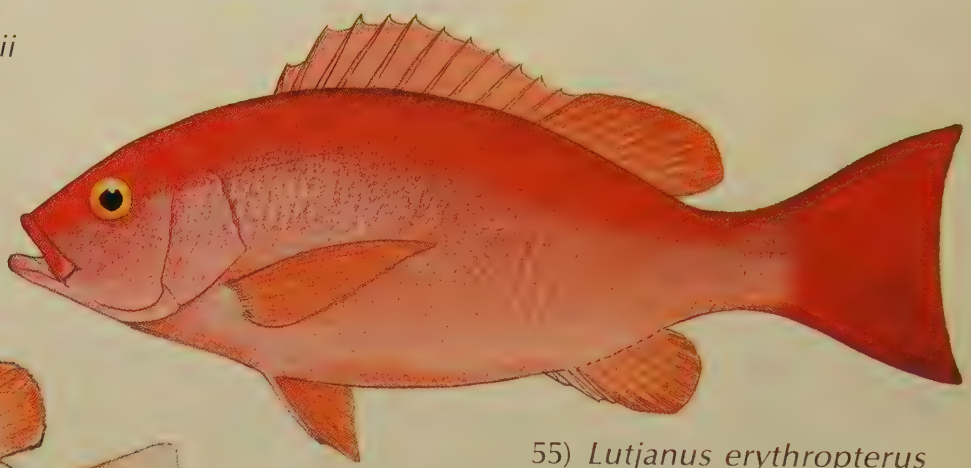
52) *Lutjanus decussatus*

PLATE XIV

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

53) *Lutjanus dodecanthoides*

54) *Lutjanus ehrenbergii*



55) *Lutjanus erythropterus*

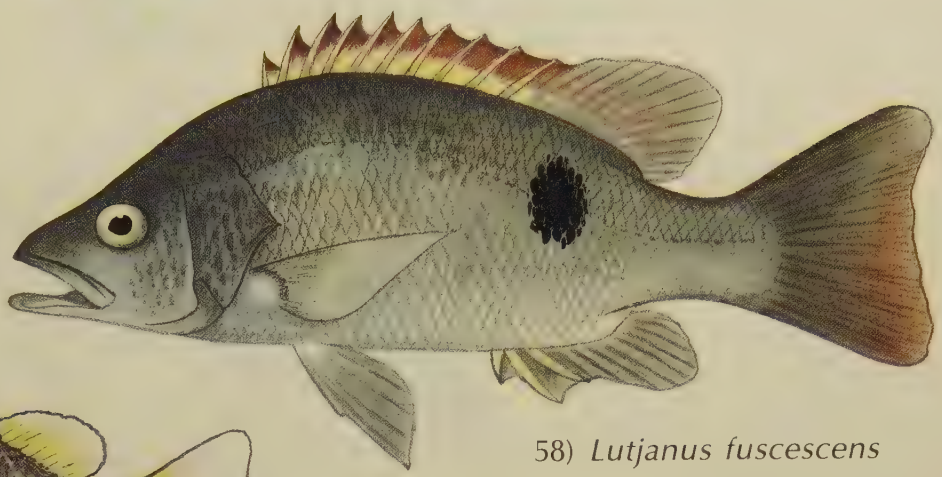
55a) *Lutjanus erythropterus* (juvenile)

56) *Lutjanus fulviflamma*

PLATE XV

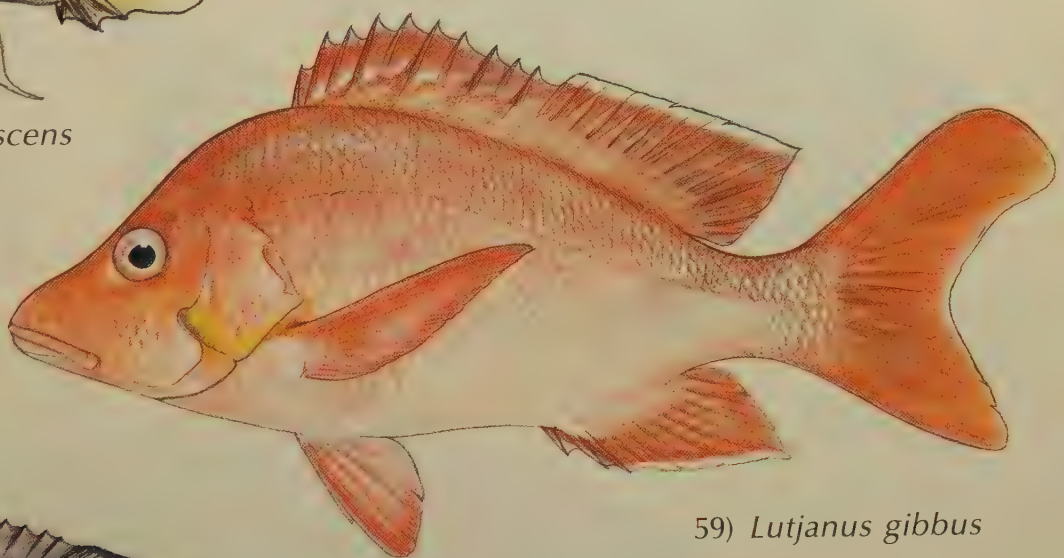
Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

57) *Lutjanus fulvus*

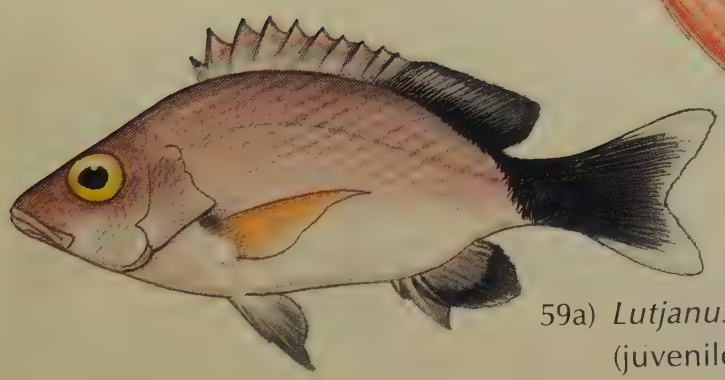


58) *Lutjanus fuscescens*

58a) *Lutjanus fuscescens*
(juvenile)



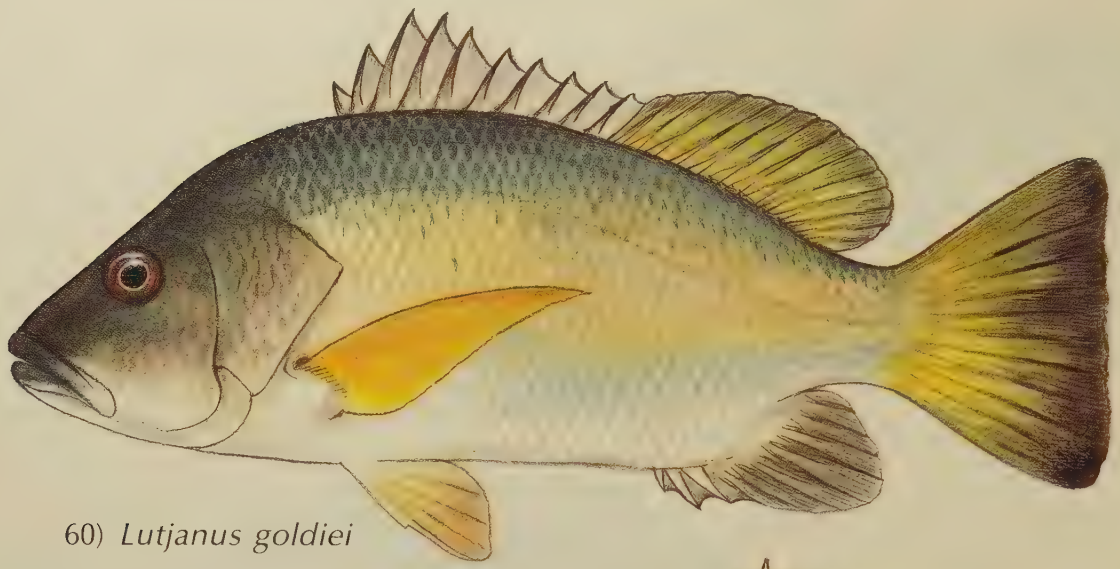
59) *Lutjanus gibbus*



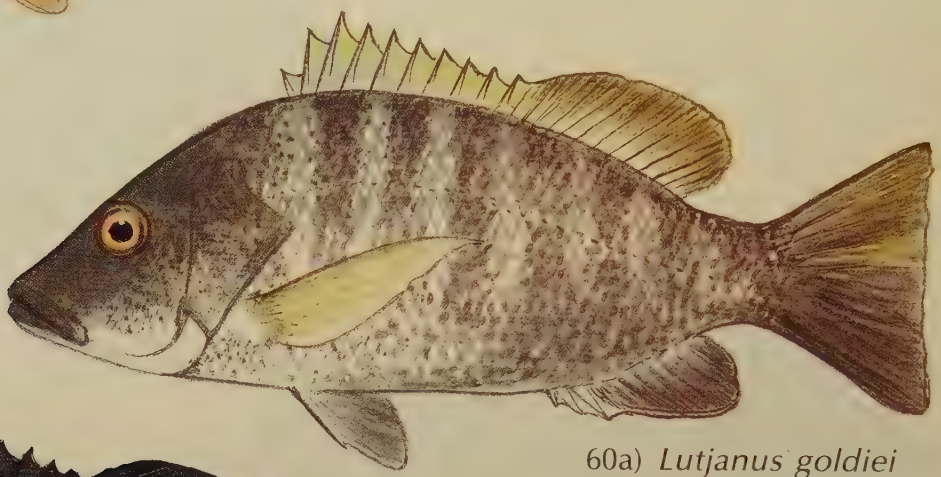
59a) *Lutjanus gibbus*
(juvenile)

PLATE XVI

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

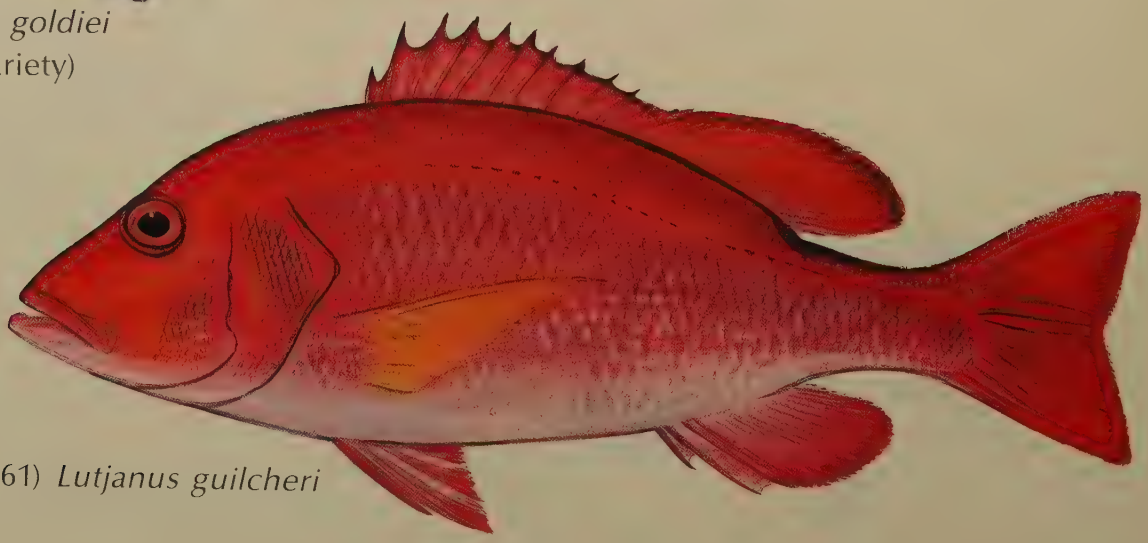


60) *Lutjanus goldiei*



60a) *Lutjanus goldiei*
(barred variety)

60b) *Lutjanus goldiei*
(black variety)



61) *Lutjanus guilcheri*

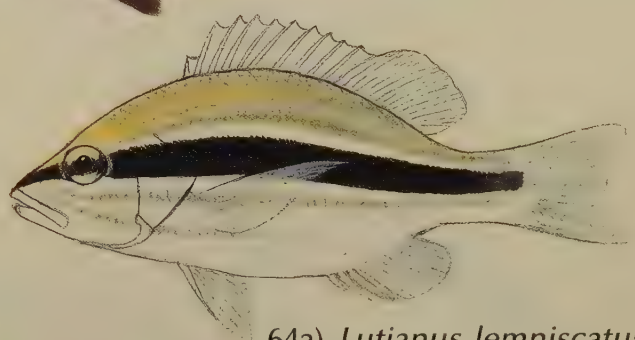
PLATE XVII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

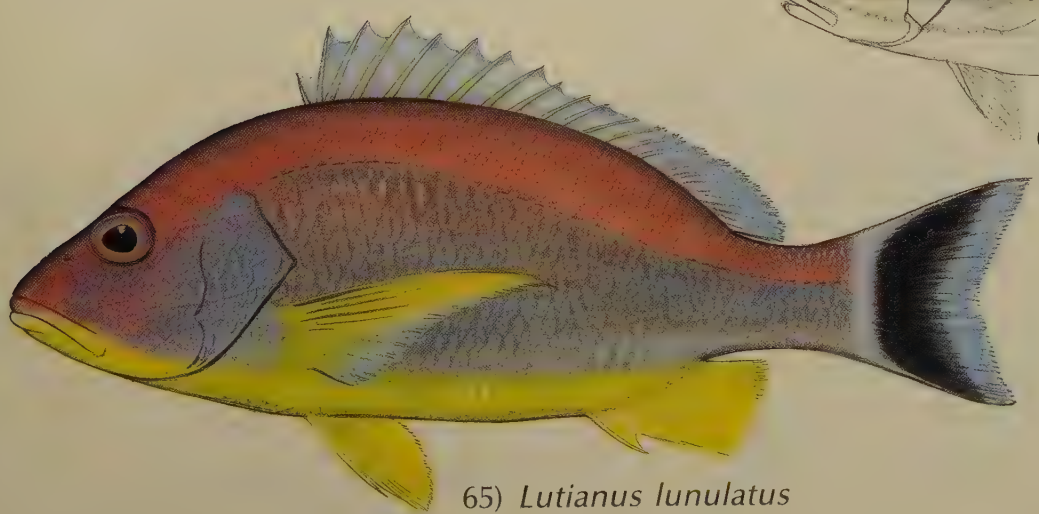
62) *Lutjanus johnii*

63) *Lutjanus kasmira*

64) *Lutjanus lemniscatus*



64a) *Lutjanus lemniscatus* (juvenile)



65) *Lutianus lunulatus*

PLATE XVIII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

66) *Lutjanus lutjanus*

67) *Lutjanus madras*

68) *Lutjanus malabaricus*

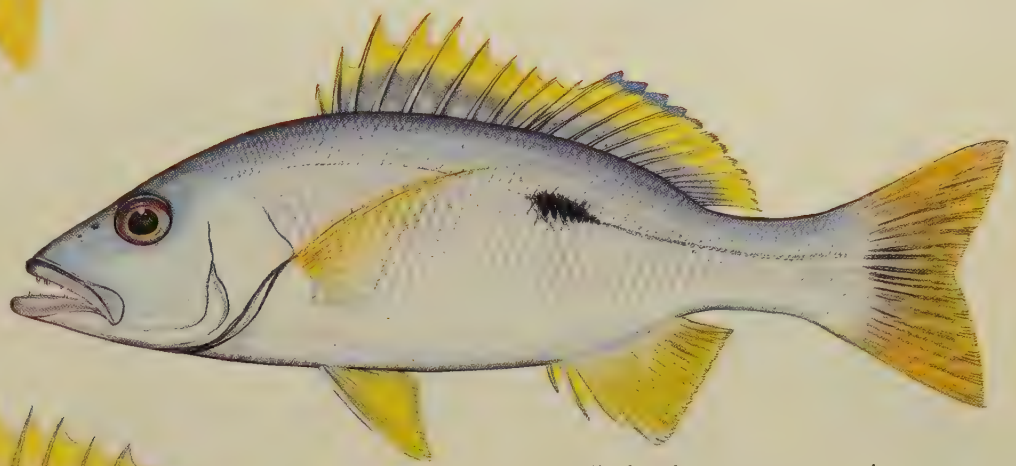
68a) *Lutjanus malabaricus*
(juvenile)

69) *Lutjanus maxweberi*
(juvenile)

PLATE XIX

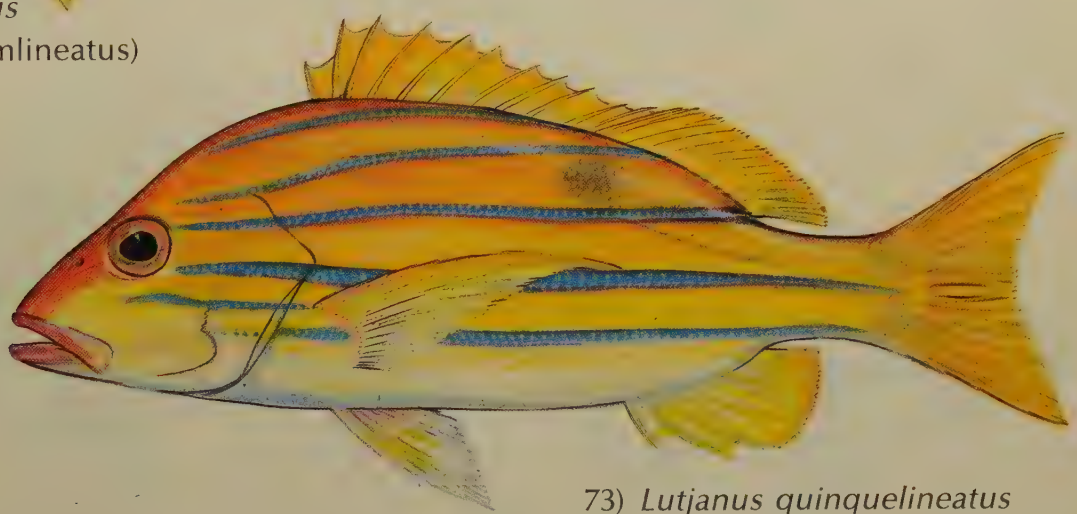
Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

70) *Lutjanus mizenkoi*



71) *Lutjanus monostigma*

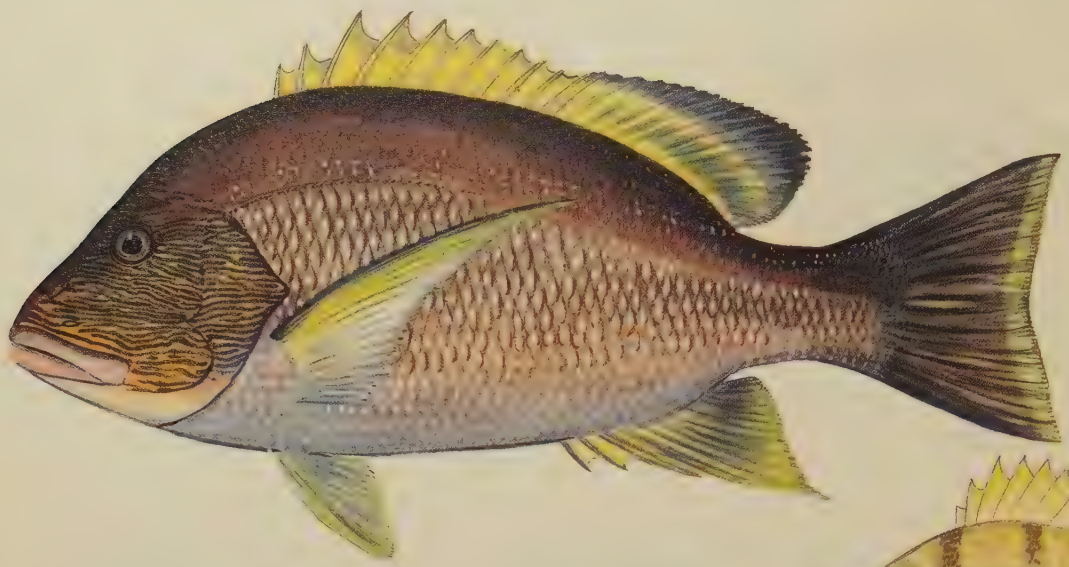
72) *Lutjanus notatus*
(= L. duodecemlineatus)



73) *Lutjanus quinquelineatus*

PLATE XX

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

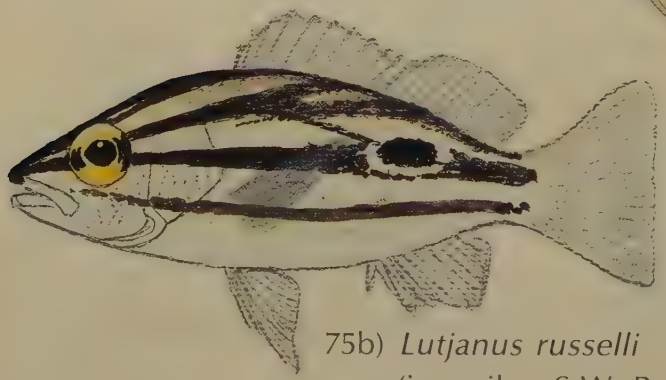


74) *Lutjanus rivulatus*

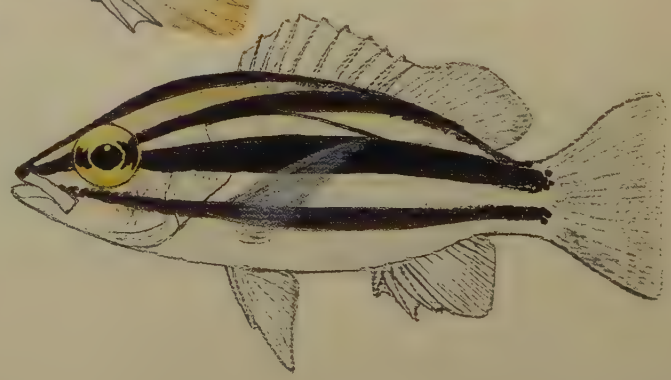
74a) *Lutjanus rivulatus*
(juvenile)

75) *Lutjanus russelli*
(Indian Ocean)

75a) *Lutjanus russelli*
(Pacific Ocean)



75b) *Lutjanus russelli*
(juvenile - S.W. Pacific)

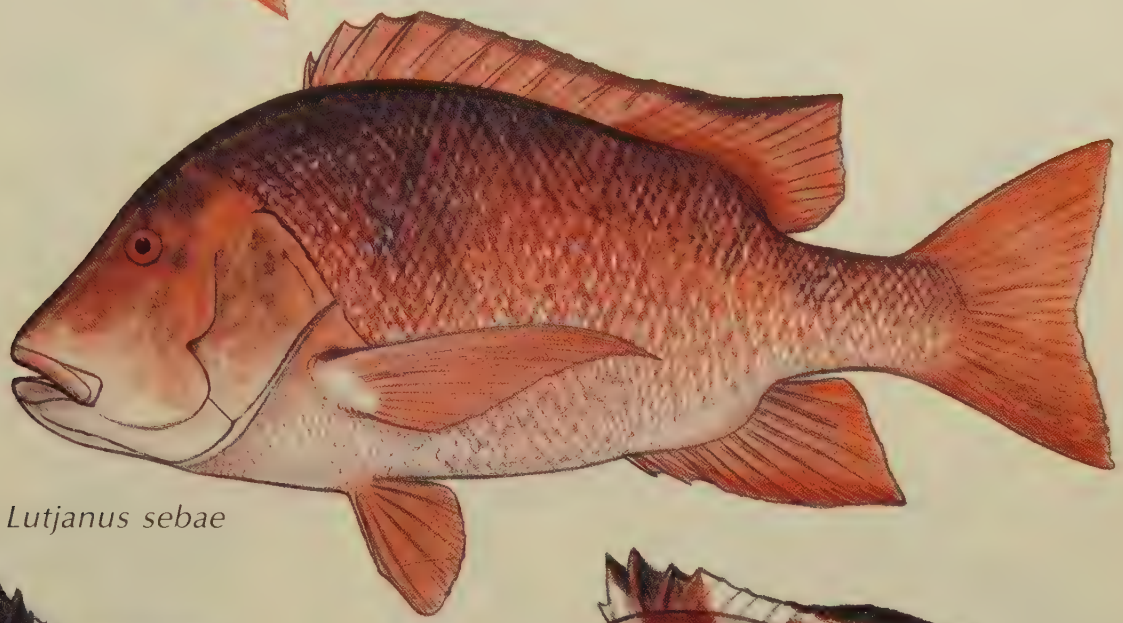


75c) *Lutjanus russelli*
(juvenile - N.W. Pacific)

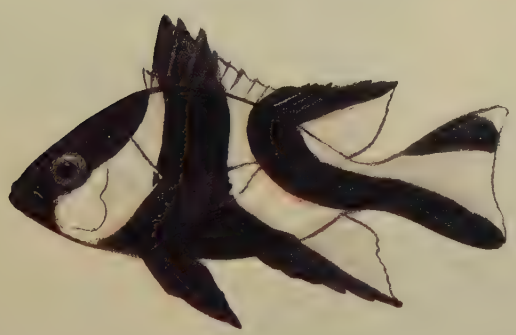
PLATE XXI

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

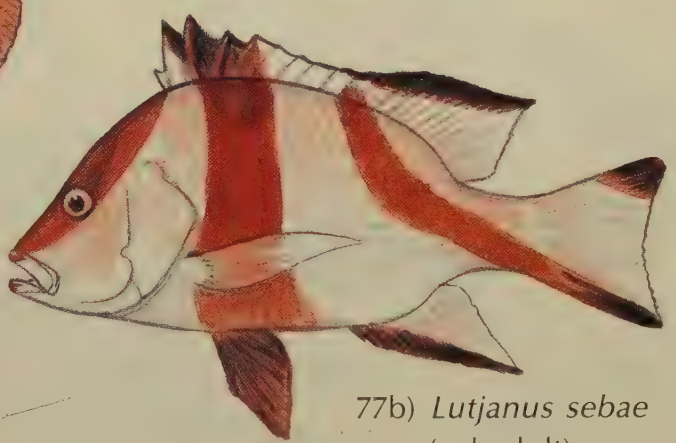
76) *Lutjanus sanguineus*



77) *Lutjanus sebae*



77a) *Lutjanus sebae*
(juvenile)



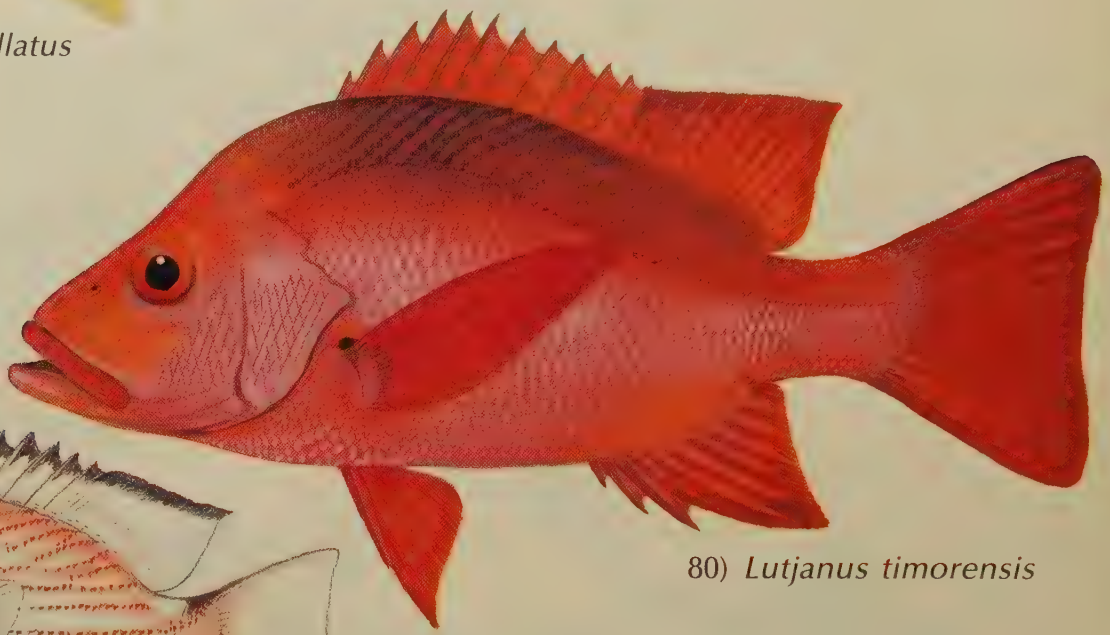
77b) *Lutjanus sebae*
(subadult)

78) *Lutjanus semicinctus*

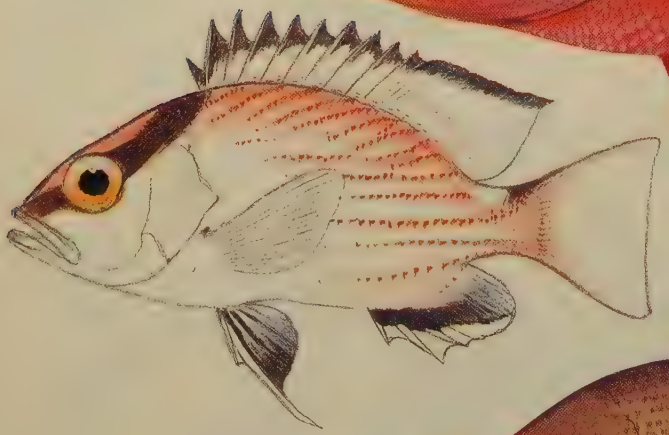
PLATE XXII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

79) *Lutjanus stellatus*



80) *Lutjanus timorensis*



80a) *Lutjanus timorensis*
(juvenile)

81) *Lutjanus vitta*

81a) *Lutjanus vitta*
(juvenile)

PLATE XXIII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

82) *Macolor macularis*

82a) *Macolor macularis* (juvenile)

83) *Macolor niger*

83a) *Macolor niger* (juvenile)

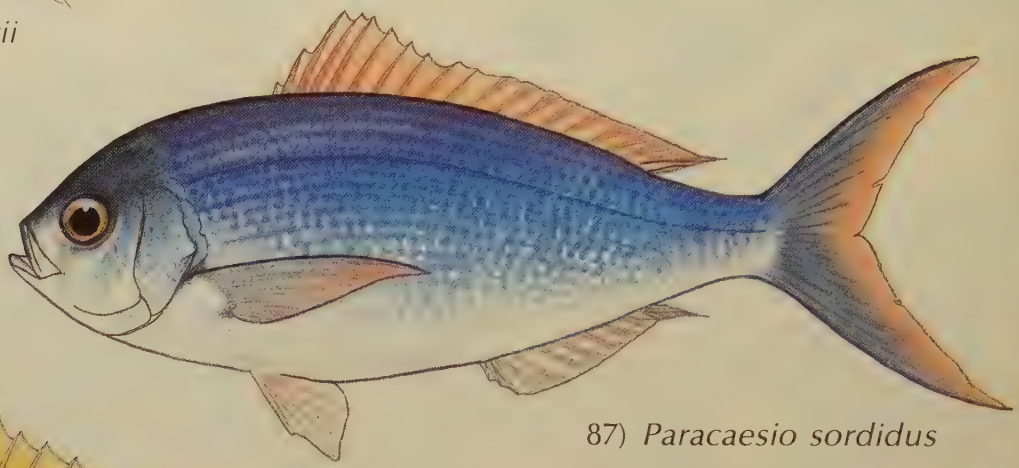
84) *Paracaesio caeruleus*

85) *Paracaesio gonzalesi*

PLATE XXIV

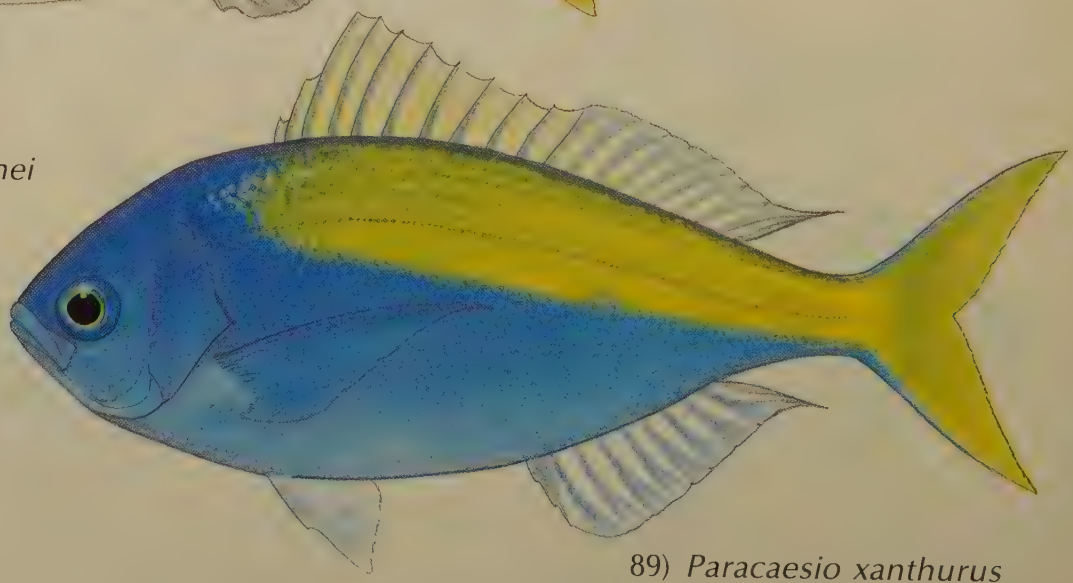
Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

86) *Paracaesio kusakarii*



87) *Paracaesio sordidus*

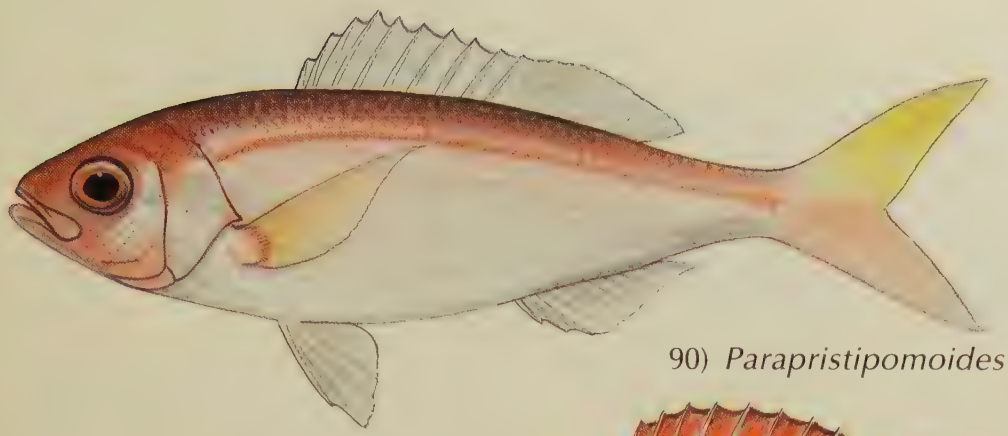
88) *Paracaesio stonei*



89) *Paracaesio xanthurus*

PLATE XXV

Indo-West Pacific - Fishing Areas 51, 57, 61, 71 77 (in part), 81



90) *Parapristipomoides squamimaxillaris*

91) *Pinjalo pinjalo*

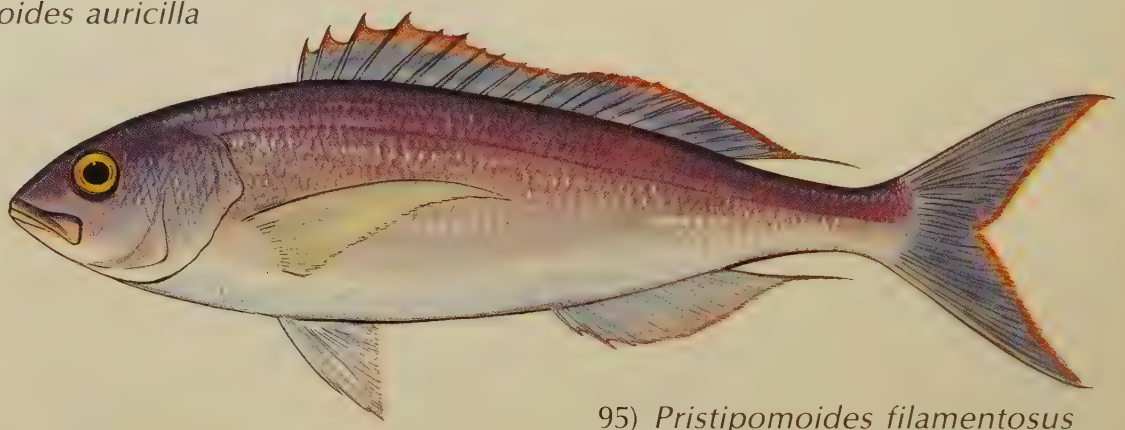
92) *Pinjalo sp.*

93) *Pristipomoides argyrogrammicus*

PLATE XXVI

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

94) *Pristipomoides auricilla*



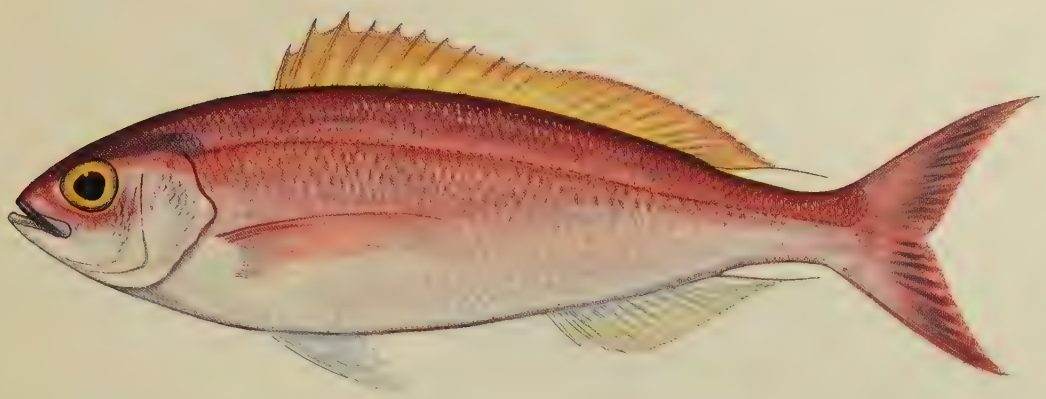
95) *Pristipomoides filamentosus*

96) *Pristipomoides flavipinnis*

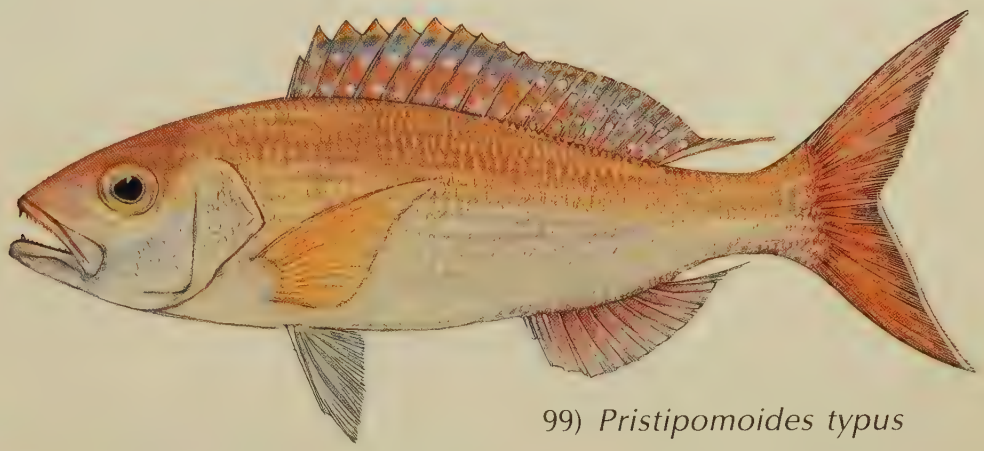
97) *Pristipomoides multidens*

PLATE XXVII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

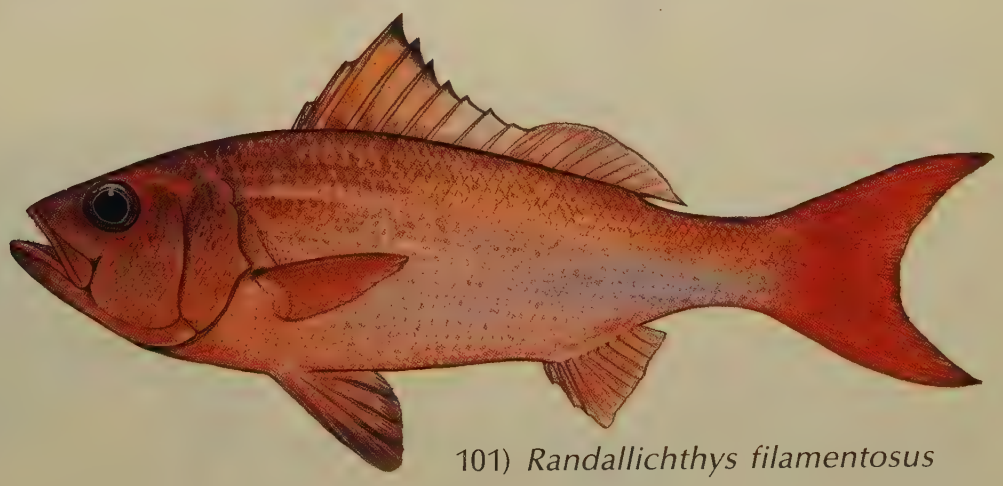


98) *Pristipomoides sieboldii*



99) *Pristipomoides typus*

100) *Pristipomoides zonatus*



101) *Randallichthys filamentosus*

PLATE XXVIII

Indo-West Pacific - Fishing Areas 51, 57, 61, 71, 77 (in part), 81

102) (adult)

102a) (juvenile)

Symphorichthys spilurus

103) *Symphorus nematophorus*

103a) *Symphorus nematophorus* (juvenile)

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